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The Automobile

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ONE OF THE NEW FIFTH AVENUE ELECTRIC STAGES.

The New Fifth Avenue Electric Stages.

The work of replacing the prehistoric horse stages on Fifth Ave. in New York City, which was begun some months ago, with the installation in service of four Riker buses of the so-called Wilkesbarre type, is now being pushed rapidly forward. Six new buses, having a seating capacity of twelve passengers inside and six outside, in addition to the driver, have lately been put in service, and others will be added as rapidly as they can be built.

The Wilkesbarre buses, which are similar in design to the vehicle illustrated in these pages last January, are of two sizes, seating sixteen and eighteen passengers, respectively, there being two of each size. They were originally built for end loading battery trays, but one of the smaller ones has been remodeled for underslung trays. The new vehicles all have underslung batteries, which can be renewed with much greater rapidity than the end loading trays.

The new vehicles have two motors of about 5 HP. each, and the batteries are of the Exide type, with 48 cells and a capacity of approximately 280 ampere hours, corresponding to about 50 miles. The weight of the batteries with tray is 3,800 pounds, and the weight of the vehicle complete is given as 10,350 pounds. They are equipped with wheel steering and the controller, which is of the Standard Electric Vehicle Co. type, gives four forward speeds up to 15 miles an hour. A ten-cent fare is charged, as against five cents for the horse stages, and the electric vehicles, with stops at every four blocks, make the round trip from Bleecker St. to Eighty-eighth St. on Fifth Ave. in about an hour and a quarter, as against one hour and forty minutes for the older vehicles. The vehicles are lighted by two flat marine lights in the ceiling, and side lights.

The New York Electric Vehicle Transportation Co., which is operating these vehicles under the franchise of the defunct Fifth Avenue Stage Co., has nearly completed two large vehicles with a seating capacity of eighteen passengers inside and fourteen outside, and these, it is stated, will weigh about 15,000 lbs.

These vehicles are cared for and loaded in the old quarters of the Fifth Ave. stage line at East Eighty-eighth St., near Fifth Ave., and the facilities for handling the battery trays, while much less extensive than those of the new plant of the New York Electric Vehicle Transportation Co., described in these pages last March, are much the same in principle and are fully adequate to the present requirements. They include transfer tracks and battery-carrying trucks, and a lifting hydraulic ram beneath the loading stand, by which batteries may be lifted up or down from the trucks to their position under the floor of the vehicle.

A 12-H.P. Panhard Gasoline Omnibus.

The omnibus shown in the accompanying cut was lately imported by Smith & Mabley, the American representatives of Charron, Girardot & Voigt, and was photographed at their new quarters, 514 Seventh Ave., New York. It is equipped with a standard Panhard 12-H.P. 4-cylinder engine, and seats thirteen people besides the driver. It has baggage space on the top, and parcel space just below the footboard of the topmost seat. Below this, and back of the engine, is the water tank, which is of liberal size. The gasoline tank is on top and just back of the seat. The running gear comprises elliptic front and semi-elliptic rear springs, and the wheels are 36 inches and 48 inches respectively, with 3-inch solid tires. The interior is very handsomely finished, being, in fact, more like a private coach than a public 'bus.

A 12-HP. PANHARD OMNIBUS.

A New Service for the Automobile.

It is reported that the Mill Creek Traction Co. has purchased three automobiles, which it will use in carrying passengers in Hamilton to and from the cars at the end of its line. Each vehicle will have a carrying capacity of twenty passengers. The company's electric railway line runs from Cincinnati to Hamilton, and as the latter city refuses to allow the company to build its line into the city, it takes this method to accommodate its patrons over the part that it is not allowed to operate its railway. This application of the automobile omnibus will be noted with considerable interest by those who are contemplating the establishment of similar lines.

The "Autocar."

The "Autocar" enjoys a place by itself among purely American light gasoline vehicles. Although it is heavier than it was a year ago, it has never been a heavy vehicle, and therein it differs from most other machines of similar proportions on this side of the water, which have been either refined, after much painful effort, from the unwieldy contraptions of more primitive days or else frankly borrowed from the French. Though it is not a touring machine, it can give a creditable account of itself under severe road conditions, and for runabout uses its neat design and light weight—less than 150 lbs. per horsepower—have made it very popular.

The illustrations herein give a good idea of the mechanism of this vehicle. Figure 1 is an inverted plan or bottom view, with the body removed. Figure 2 shows the motor separately, with the radiator placed beside it; and Fig. 3 shows the rear axle construction. Fig. 4 shows the trembler used for ignition.

In producing a light vehicle, half the problem is to reduce the weight of the motor and transmission gear to a point where it will not severely tax the running gear. In this branch of endeavor the makers of the "Autocar" have been particularly successful. The motor, which is of the horizontal opposed-cylinder type, has cylinders of 4 inches bore and stroke, and delivers upward of 8 horsepower at its highest speed of 1,200 R. P. M., corresponding to a piston speed of 800 feet. It has an aluminum crank case, and the cylinder heads are cast integral with the cylinders. A single cam, on the 2 to 1 shaft

on top of the crank case, actuates both exhaust valves, while the inlet valves, which are in line with the exhaust valves, are exposed by removing the valve bonnets A A. The bottom of the case containing the speed changing gears is seen at B in Fig. 1. It is of aluminum, and is arranged to swing slightly on the engine shaft and the adjacent bearing of the crank case. There are two forward speeds and a reverse, obtained by sliding gears, and the clutch, outside of the gear case near the end of the crank shaft, acts between the crank shaft and the first set of gears. This is accomplished by keying the three driving pinions to a bronze sleeve surrounding the extension of the engine shaft, while one end of this sleeve is made integral with a disc flange running inside the clutch. The outer shell of the clutch is keyed to the engine shaft, and it grips fast to the flange of the bronze sleeve when thrown into engagement. Below the engine shaft, also in the gear case, is a countershaft carrying on its projecting end the sprocket pinion, and carrying also two spur gears sliding together on a squared portion of the shaft. According to position, the smaller or larger gear meshes with the high speed or low speed pinion on the bronze sleeve above, or with an intermediate pinion meshing with the reverse pinion on the same sleeve. To change speed, the clutch is first released, allowing the driving pinions and sleeve to turn loosely, and then the sliding gears below are shifted.

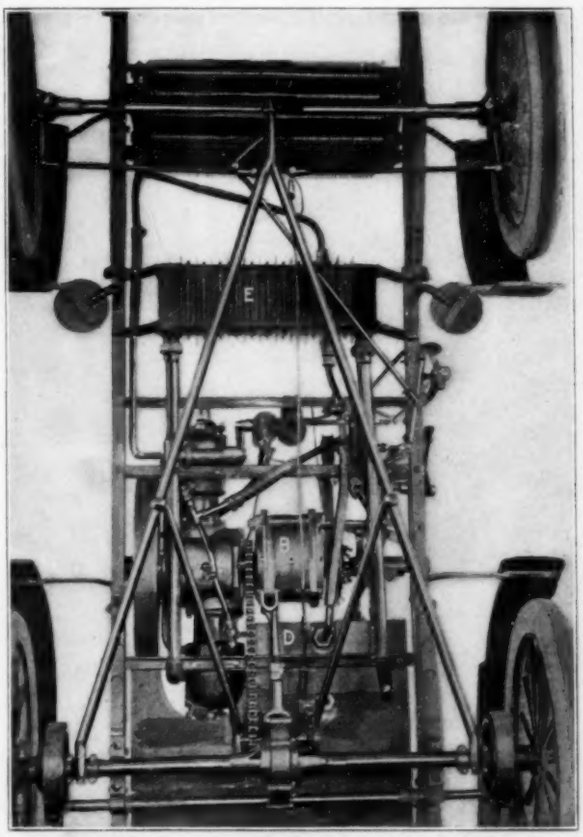


FIG. 1. THE "AUTOCAR"—BOTTOM VIEW OF MACHINERY AND RUNNING GEAR.

From the sprocket pinion on the countershaft a chain drives to a similar sprocket pinion on a short shaft just above the differential, and running in bearings in the differential case. This shaft, which is clearly seen in Fig. 3, carries a spur pinion meshing with a gear which itself carries the differential pinions. At the other end it carries a small brake wheel C. Two metal jaws work on this wheel, and the arrangement, which is double acting, is operated by a pedal. As the illustration clearly shows, the rear axle comprises essentially two outer tubes, brazed respectively into the two halves of the cast steel differential case, and containing bearings in which run the right and left driving members, which are solid and abut in the center.

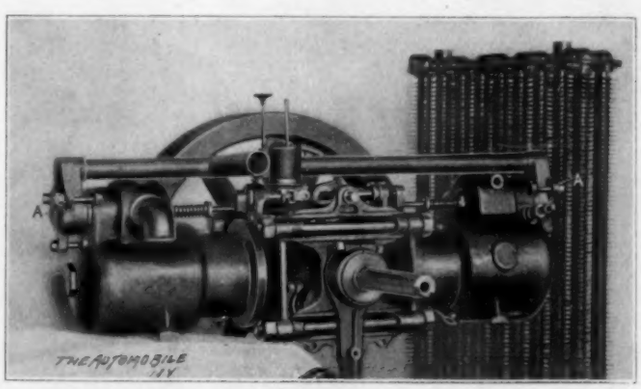


FIG. 2. MOTOR AND RADIATOR.

Next to the rear wheels are two emergency brake drums, the bands on which are tightened simultaneously by a second pedal. The chain is tightened by the threaded and adjustable link D, Fig. 1, the gear case swinging forward to make up for adjustment.

The changes of gear are effected by a handle just below the side steering lever and concentric with it. This handle has three positions from extreme forward to extreme backward, and neutral positions, when the gears are out of mesh, between these. By virtue of an interlocking device it is impossible to shift the gears except when the clutch is out, or to engage the clutch except when the gears are properly meshed.

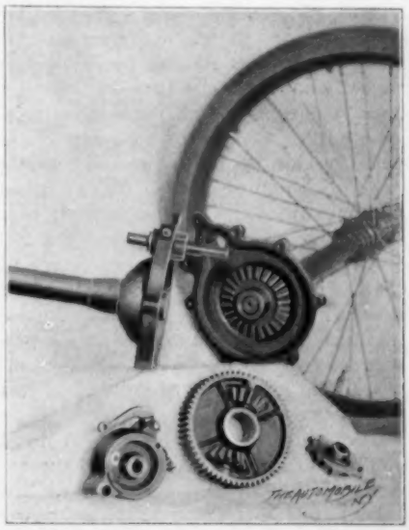


FIG. 3. REAR AXLE CONSTRUCTION.

The vaporizer of the "Autocar" is of the float feed atomizing type. It divides the incoming air into two streams, one of which sucks a spray of gasoline with it while the other dilutes the mixture; and a throttle valve, combined with the vaporizer, is provided with a shutter through which the diluting stream passes, and which is partially closed as the shutter turns to cut off the mixture. The effect of this is to maintain the proportions of the mixture approximately constant,

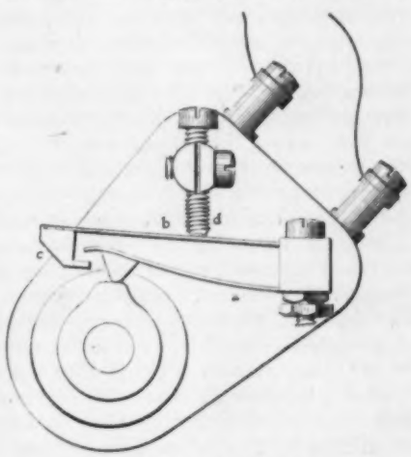


FIG. 4. THE TREMBLER.

whereas with a fixed dilution inlet the mixture would become slightly weaker as it was throttled. From the throttle a link extends to the trembler, so that the two move together, and the spark is ad-

vanced *pari passu* with the opening of the throttle.

The trembler is shown diagrammatically in Fig. 4. Instead of the notch, the cam has a rise, and there are two springs, a stiff spring a, on which the cam acts, and a light spring b, with a weight c, at its end, vibrating against the contact point d. The spring a normally holds b out of contact, but when quickly raised by the cam it sets the latter in vibration. Instead of using two coils, the secondary current passes in series through the spark plugs of both cylinders. This saves some complication, and as the air resistance is much greater in the cylinder where the gases are compressed than in the other, the waste of current is unimportant.

The circulatory system includes a 7½-gallon tank, a centrifugal pump driven by a belt from the outside of the clutch shell, and the radiator under the 6½-gal. gasoline tank in front. Asbestos sheets protect the gasoline tank from the heat of the tubes. The muffler, E, is built up of cast iron segments with sheet iron baffle plates between them, these being drilled in a diminuendo series of holes from the entrance to the outlet of the muffler. The makers state that the reduction of power when the muffler is applied is barely measurable. The wheel base is 5 feet, and the gauge 4 feet 2 inches. Wood or wire wheels are supplied, with 28 by 3-inch Dunlop tires, in place of the single tube tires formerly fitted. Plain bearings are this year substituted for ball bearings in the hubs.

As most of our readers know, the vehicle is built by the Autocar Co., Ardmore, Pa.

The Fischer Combination Motor Stage.

The accompanying illustration shows a motor stage embodying the Fischer principles of combined gasoline engine and electric propulsion. This vehicle, which has attracted much notice on the streets of New York City recently, derives its primary power from a 3-cylinder vertical gasoline engine of 10 HP. The engine is in front, under the driver's seat, and to the forward end of the shaft is coupled the armature of a 10-HP. Crocker-Wheeler multipolar dynamo. The engine runs constantly while the vehicle is in service, and the current from the dynamo is charged into a 45-cell storage battery under the floor. From the batteries current is delivered to two 5-HP. motors forward of the rear axle and driving the rear wheels separately through spur pinions and gears in the usual way. The battery capacity is said to be sufficient to propel the vehicle four miles if the engine should become disabled. In practice, the batteries are never allowed to become fully charged, and in ordinary running the current goes direct from the dynamo to the motors, the batteries thus serving to equalize the dynamo output and to take the peak of the load on grades. The engine runs at will no governor being used, but it can be stopped at will if the batteries should become fully charged.

THE FISCHER MOTOR STAGE WITH COMBINATION GASOLINE AND ELECTRIC PROPULSION.

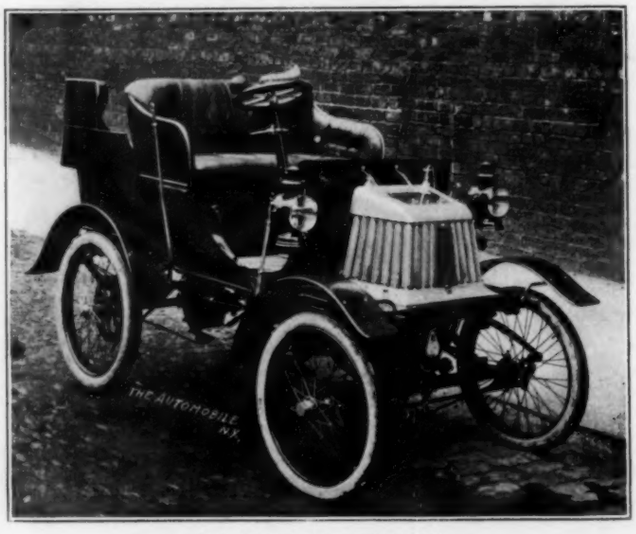
The engine, motors, and batteries are all of special Fischer design. The engine is cooled by forced circulation, there being radiating coils under the battery box, and in cold weather the jacket water may be diverted to heating pipes in the interior of the vehicle, thus warming the latter without additional appliances. A gear driven centrifugal pump keeps the water in circulation. The interior is lighted by six electric lamps of 8-candle power, and the fittings are attractive.

The running gear includes semi-elliptic rear springs, linked at their rear ends, while the front springs are of the platform type No reaches are used. The wheels are 36 and 44 inches in diameter respectively, with 4-inch Calumet solid rubber tires. The total weight of the vehicle ready to run is given at 3½ tons. It will seat ten passengers inside and five or six outside. Wheel steering is supplied, operating through pinion and rack, and the vehicle runs very smoothly and quietly and with very little vibration from the engine.

The builders of the vehicle are the Fischer Motor Vehicle Co., 1311 Hudson St., Hoboken, N. J.

The Argyll Voiturette.

The accompanying illustration shows the Argyll voiturette, built by the Hozier Engineering Co., of Glasgow, which was mentioned in the article on "Glasgow Trials and Other Automobile Matters in Great Britain" in these pages last November. It is fitted with the Motor Mfg. Co.'s



THE ARGYLL VOITURETTE.

English De Dion motor of 5 H.P., water jacketed. The motor is in front and transmits through the speed changing gears and through bevel pinion and gear to the live rear axle. The brakes are applied to rims attached to the rear-wheel hubs, and the brake-shoes are wood blocks attached to wire rods. The frame is made very light, and its longitudinal members are stiffened by truss rods. The vehicle seats four very comfortably, and attracted much notice by its excellent performance.

Some Putnam County Roads.

A good idea of the character of the road on Nelson Hill and just north of it is given in the two views on this page. Fig. 1 is taken looking down the last quarter of the hill. The steepness of the descent is but poorly indicated by the camera, but may be judged from the fact that the road beyond the foot of the hill where it skirts the base of a hill in the distance and appears to rise, is in fact practically level. Fig. 2 shows a turn in the road a mile or so north of the hill. The surface here is in fair condition, but the road is so narrow that vehicles can pass each other only with great difficulty. The awkwardness and even danger of running an automobile on such a road is evident, and the first move after completing the road around the hill, announced in these pages last November, will be to secure State aid for widening and hardening this part of the road.

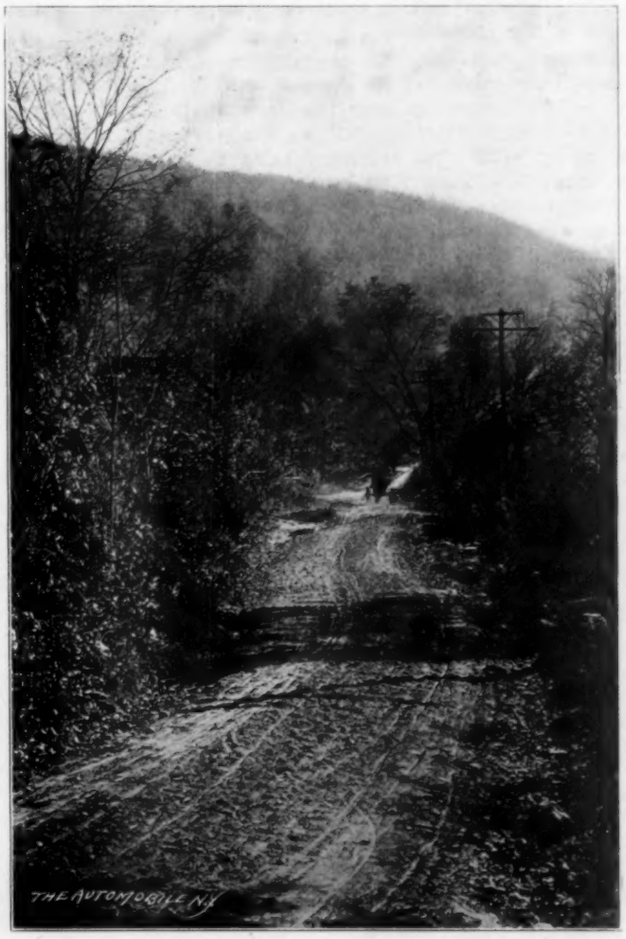


FIG. 1. LOOKING DOWN NELSON HILL.

FIG. 2. NORTH OF NELSON HILL; A TURN IN THE ROAD.

Single Tube Tires: Punctures and Their Care.

By Dr. Paul Norwood.

If you can afford to pay the price buy the heaviest and largest tires suitable to your purpose. If you wish to consider cost and are willing to do a little extra work, buy those of medium weight and treat them as hereinafter set forth.

The heavy thick-walled tires are nearly puncture proof; but they do puncture, and though they do not then collapse, still they require repair and are more difficult to plug than are those of thinner walls. This is because of the strength and resistance of the material that must be expanded in order to insert the plug. This generally results in the using of a plug smaller than is suitable, a leak remains and vulcanizing has to be done.

Tires of lighter weight are much more liable to puncture, but they are more readily repaired. Their price, too, is no small consideration, and in view of my experience I feel rather partial to those of medium weight.

At the risk of telling what in part may be to many an old story, I shall detail my method of plugging a punctured tire.

If the puncture be small I use what is called the "Sure thing" puncture needle, which is simply a large steel needle with an eye in the point. This eye is not really a hole, but a notch, whereby fine rubber bands are carried through the puncture. These rubber bands must be new and of *rubber*. They are first strung on the shaft of the needle, and after being thoroughly covered with liquid rubber, are carried one by one through the puncture. When a sufficient number have been thus placed on the inside of the tire, all of them are withdrawn by the notch in the needle, until the loops of rubber bands extend about ¼-inch outside of the tire. No tape is required and the tire may at once be inflated. A few minutes wait will insure a perfect job if the work has been properly done.

This method is good for small punctures in any tire, and with very heavy tires I like it better than plugs, even for large punctures.

If the puncture be larger, say ¼-inch or over, in a tire of medium or light weight, I first select a soft rubber plug (with a heavy button) that is slightly larger than the greatest diameter of the tire wound. I then heat a round iron rod of proper size and burn the puncture into a symmetrical round hole, which should be slightly smaller than the plug. I then clean out this hole with the highest test gasoline that I can procure, cleaning away all burnt rubber, grease and dirt. I then inject *plenty* of liquid rubber (economy

in this part of the work is the most fruitful source of failure), cover the plug with the same, insert, turn it around several times, and quickly inflate *a little*. After cutting off plug, leaving about 1-16 of an inch protruding, I wrap firmly with rubber tape, but not firmly enough to make a depression in the tire when it is fully inflated. This wrapping should be started in front of the plug and carried backward, overlapping each turn, then reverse, going back and forth *over* plug, until several layers are applied, being careful that the last layer is conducted from before backward, as are the scales of a fish. If the last layer be put on in the reverse direction dirt will be forced under it. As soon as tape is applied, inflate to 60 or 100 pounds. The wrapping over the plug must not be done unless the plug be of the best soft rubber, or the tire is quite heavy and the plug be amputated flush with the surface of the tire.

A puncture thus mended should be allowed to stand for several hours, though more than a few minutes may not be absolutely necessary, if a perfect co-aptation of the surface is obtained. The novice will remove the tape as soon as he thinks there is no leak, but he won't often repeat this. He will wait until it wears off.

Among all of the difficulties incident to puncture mending there are none so troublesome as are those arising from poor quality of plugs. I can almost forgive the tire manufacturer for using dream rubber, if he will put in plenty of duck, but the plug maker deserves no mercy if he does not avail himself of his lawful right to use the best rubber in the market.

However a puncture be mended, it is liable sooner or later to leak, especially if for any reason the tire be not kept fully inflated; and if it escapes other injuries it will eventually loosen from the more or less constant hammering which it receives from small irregularities on the road.

Vulcanizing a tire means generally the cutting off of the surface rubber and, perhaps, a part of the outer canvas, clear around the tire at seat of wound, rewrapping with canvas and remoulding on the surface with melted rubber and hot irons. This method is troublesome and expensive, and is used only when other means are insufficient. Though usually efficient, there is a certain percentage of failures, depending upon skill, honesty and the quality of the rubber. Personally I have had poor luck with vulcanized tires.

When there exist leaks about plugs and through numerous small holes, and vulcanizing is for any reason not desired, there remains another help in the form of "puncture cures." These are liquids, or semi-liquids which, when injected through the valve stem, coat over the internal surface of the tire. Among these cures may be mentioned the following, given more or less in the order of their efficiency: Liquid rubber, varnish shellac, Canada balsam, collodion, liquid glue, molasses, condensed milk, cooked starch, white of egg, red lead, white lead, paint, flour and water (cooked or raw), warm lard, hot tallow, and various compounds of these substances, such as collodion with Canada balsam, 5% of latter to 95% of former, glycerine, water and glue in varying proportions.

To those familiar with the physical properties of these substances, it will at once appear that some of them ought to be good, while others could do scarcely more than render transitory help. They all, however, fail in one or more vital points. Some are too expensive in necessary quantities; some lack efficiency, and some are so difficult to remove, should vulcanizing be required, as to make repairs more expensive than a new tire.

The greater part of these cures I have tried, but I have formulated a compound which answers practically every condition that may arise, and properly used will mend any redeemable tire, unless wounds are very large. This compound is composed of molasses and glue in varying proportions, united by heating in a water bath. By increasing or reducing the percentage of glue one may make the compound as soft or as hard as desired, the product being a substance such as that of which printers' rollers are composed. The cost is insignificant; it is easily made and injected, and should vulcanizing be necessary, which is doubtful, it can be removed by heat and hot water.

The proportions which I find most suitable are given in the three following formulae:

No. 1.—Molasses, 2½ pints; powdered glue, 1 troy pound.

No. 2.—Molasses, 2½ pints; powdered glue, 1½ troy pounds.

No. 3.—Molasses, 2½ pints; powdered glue, 2 troy pounds.

In each case the ingredients are mixed and placed in a vessel, which in turn is placed in another receptacle partially filled with water. Heat until the glue is liquefied, and the compound is ready. It will be understood that the density of such a compound is more or less altered by extreme temperatures, warm weather having a softening effect.

Formula No. 1 I use for ordinary leaks, and even for small punctures in the winter time. It remains somewhat sticky in even the coldest weather, and yet it has sufficient body at any temperature to stop any small leak. The quantity required will depend on the size of the tire, varying between one-half pint to two pints. I generally use plenty and have yet to fail in stopping small leaks; and with small punctures I don't even stop to plug but inject this formula at once. A tire treated thus is not puncture proof, but I have one such in which I have purposely driven darning needles, small nails and the like, to demonstrate its self-healing properties. A much larger puncture might require plugging. If so, heat a bent wire of sufficient strength and melt away the coating about the puncture, put in your plug with liquid rubber, inflate slightly, inject more of the compound, and your tire is mended. If it should fail then use formula No. 2, which is heavier. I don't believe that this will ever fail with punctures. Long, ragged rents are quite different and may require vulcanizing, but you may still, in an emergency, wrap the tire with tape and fill the tire with No. 3. Pour cold water over the tire until it is thoroughly cool and it is quite serviceable. This plan is of great value if an accident happens while touring, as glue and molasses are everywhere obtainable and no special apparatus is required. In short, there is no leak of whatever size that cannot be cured or the tire rendered serviceable by one or more of these formulae.

If desired the tires may be completely filled at the first operation, and the result, if properly done, is quite as satisfactory as is the pneumatic tire; but it must be properly done with the suitable formula. For bicycle tires formula No. 1 is right; for carriage tires up to 2½ inches, formula No. 2; for very heavy carriages, larger tires and automobiles, formula No. 2 or No. 3, depending on the weight. Under 1,000 pounds, No. 2 is best, while over that, No. 3 should be used. The tire thus treated is not pneumatic. It is a solid tire, but the resilience of this composition is sufficient to dissipate all undue vibration, and the uninitiated would think that he was riding on pneumatics. Such a tire is heavier, but it is through with puncture troubles, and if all of your tires are thus treated, you may leave your pump at home and enjoy a mental peace otherwise impossible.

In treating tires with these compounds several points must be observed. Ordinary glue and molasses are good enough. While your glue is melting take out the valve of the tire. For an injector use one of your numerous pumps from which the valve has been removed. Take out its plunger, fill the barrel with the hot mixture and inject. Pull up the pump plunger quickly, fill barrel again and repeat until proper quantity has been forced into tire. Be careful that no lumps are in the mixture. If you are simply to coat over the inside of tire, it should be rotated while collapsed, rolling it on the ground. No wait is really necessary and you may at once inflate.

If the weather be cold the pump and hose should first be warmed with hot water. If it is your purpose to transform your pneumatic into this solid or cushion tire, then you must be more careful in the injecting. The wheel must be raised free from the ground and the mixture injected so as to just fill the tire; no pressure beyond this must be used, and when the tire is nearly full the tire valve must be replaced, the valve stem being at the

uppermost position of the wheel. A small puncture is then made on topmost point of tire for the escape of air. It must be frequently freed of composition so as to allow the last particle of air to escape. With good tires, unless they be unusually large, a hair large leaks. No wait is required; otherwise it is best to cool tire before using.

I have over twenty tires, and all except two new ones have received some such treatment as above. If some other puncture cure has been used it will make no difference about its transformation into the solid or cushion by this means. Your rims should be flanged, of course, and this is also true of pneumatics, but should you find that in converting your tire into solid, you have used insufficient material, take it off and thoroughly heat it, or boil sections of it, and put in more composition.

The whole proceeding is manifestly simple, and the best tire is thereby made better, the poor tire good, and the worthless serviceable.

The Toledo Steam Carriage, Model D.

This carriage, which is the latest production of the Toledo factory of the American Bicycle Co., is designed with special reference to the onerous requirements of general touring. To this end it comprises several changes, chiefly in the running gear, from the Model A, which was first exhibited a year ago. These changes include a flexible underframe, a wheel base lengthened from 56 inches to 62, and a pair of elliptic front springs in place of the transverse reversed elliptic or X springs used in the Model A. The underframe is a modification of the triangular arrangement. The front axle is swiveled at its center to the apex of a triangle of steel tubes, whose base is the

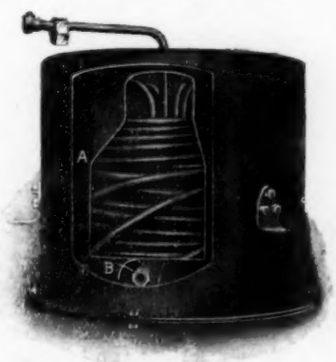


FIG. 2. THE BOILER.

rear axle. This permits free vertical swiveling of the front axle, and at the same time preserves the axles from relative lateral displacement; but instead of permitting the elliptic front springs to absorb unaided the horizontal component of road shocks sustained by the front wheels, as is usually done, this component is practically transmitted to the entire running gear by longitudinal brace tubes, joined at each end, which connect the ends of the front and rear axles. This eliminates the disturbance of the steering caused by fore and aft see-sawing of the front axle on striking an obstacle, but at the expense, apparently, of more severe stresses on the wheels and running gear as a whole.

The boiler of the Model D is identical with that of Model A, and is illustrated in Fig. 2. It may best be described as a

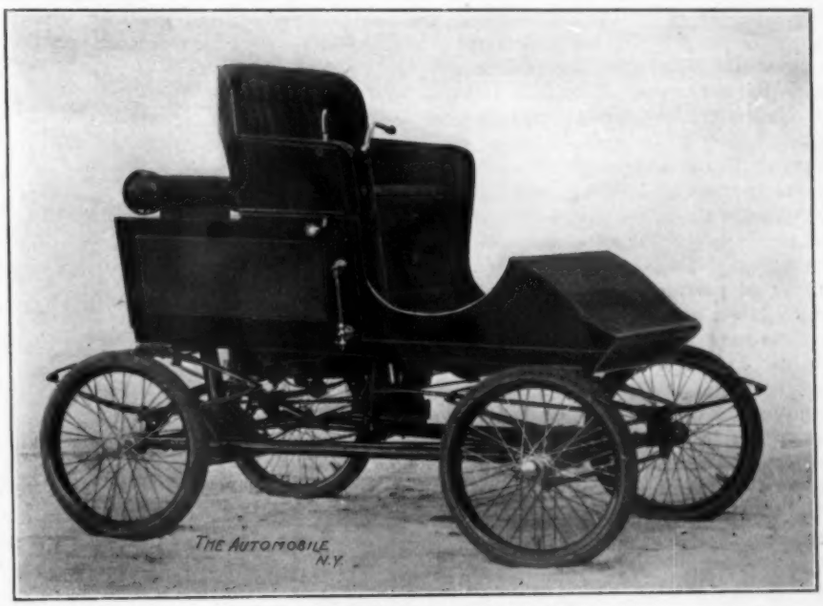


FIG. 1. THE TOLEDO MODEL D.

combination of the shell and water tube types, in which the steaming qualities of the latter are combined with the steadiness in operation which a fairly large body of heated water gives to the former. Briefly stated, the boiler comprises an annular water space, A, surrounding a fire space nearly filled with a nest of coils.

FIG. 3. THE BURNER.

There are eight of these coils in all, seven being used to make steam and the eighth for superheating, and each coil is 15 feet long, with eight turns formed into a slightly conical spiral. These coils are superposed one above the other, the superheating coil being at the bottom, and are connected at their outer and lower ends to the water space just above the bottom of the boiler, while the inner ends are bent upward into longer or shorter branches, which bend again and discharge horizontally into the steam space above the water. By contracting the fire space above the coils, the steam space is made larger than the water space, and the ends of the several coils are deflected in such a way as to discharge the steam tangentially rather than radially into the steam space. By this arrangement it is claimed that the wet steam discharged from the tubes is in constant circular motion, and that the water contained in it is separated by the centrifugal effect of this movement. At the lower ends of these tubes are fixed small scoops B, which are intended to check the circular movement, induced by that of the steam,

FIG. 4. VAPORIZING COIL IN POSITION.

of the water at the bottom of the boiler, and to assist the entry of water into the tubes. Just below these scoops is a small space wherein mud may settle, to be blown out at intervals.

The superheating coil is similar to the others except that it connects at its lower

end with a vertical pipe running up through the water to the steam space, while its upper end passes straight upward and out of the boiler, where it connects with the main steam pipe. The coils are all of half inch inside diameter, and the water coils are 20 gauge, the superheating coil being a little thicker. Excluding the flange at the bottom, the diameter of the boiler is 19⅜ inches, and its height 17⅝, and the boiler shell is ¼-inch thick at the top with 3-16 sides. The tubes have 35 square feet of heating surface.

The burner of the Toledo carriage is shown in Figs. 3 and 4. In principle it is not unlike other burners of well known types, but it has some distinctive features of detail. The top of the burner, instead of being sheet steel, is a thin bronze casting, this being thought to be less liable to the troubles of blowing back. It has 312 ½-inch air tubes, around which the gas comes up through notches corresponding to the pinholes of other burners. The burner is provided with a pilot light, which is set into the aperture C, Fig. 3, and connects with the vaporizing coil D, Fig. 4. To start the burner, a cup under the pilot light is filled with gasoline, by burning which the pilot light is warmed sufficiently to start it. It quickly heats the coil D just above it, and the main burner may then be slowly turned on. The other end of the vaporizing tube comes up through one of the air tubes at E, and at the pilot light the path of the vapor divides, part going to the pilot light direct through an independent valve, and part by way of another valve and the automatic regulator to the mouth of the mixing tube at F. The pilot light has two rings of gas orifices, and burns with a yellow flame.

The engine of the Toledo carriage is, in its liberal size and substantial build, in keeping with the other details of the machine. It has cylinders 3 inches in bore by 4 inches stroke, with enclosed crank cases and splash lubrication. An unusual refinement is the use of piston valves, which are clearly seen in Fig. 5. The crossheads are of phosphor bronze, of ample wearing surface, and the guides are of cast iron, integral with the lower part of the frames, and are bored lengthwise to give cylindrical bearing surfaces. A simple modification of the Stephenson link motion is used. The crank shaft is built up, with overhung cranks. One crank is integral with the shaft, and the ball cones, eccentrics and sprocket pinion are strung on this shaft, and the other crank keyed on. The ecentrics, like the sprocket pinion, are drop forged, and are machined in pairs. The crank-pin bearings are bronze bushed, while the balls of the shaft bearings are 7-16-inch in diameter.

The water-pump is attached to one side of the engine, and is worked by a lever from one of the crossheads, giving it a stroke of ⅞-inch. The air-pump, which maintains the pressure in the gasoline tanks, is bolted to the other side of the engine, and works directly from the other crosshead. The plunger of this pump is of steel tubing with plugs brazed in the ends, and it has, of course, the same stroke as the engine. A spring-controlled relief valve in the air piping allows any excess of air to escape.

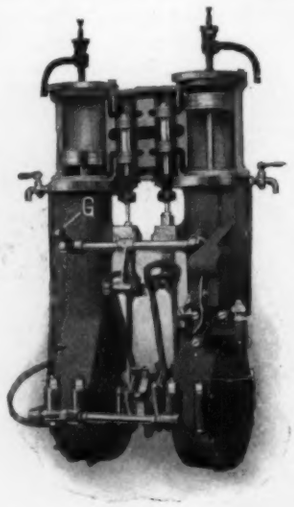


FIG. 5. THE ENGINE.

Instead of the separate levers controlling the throttle and the reversing gear, used on the majority of steam carriages, a single lever, in the Toledo, is made to perform both functions. This is accomplished by putting the lever on a rock-shaft at the inner end of which is a slotted cam-plate connected through a link with the arm G (Fig. 5). The cam-plate, in the middle of its oscillation from extreme forward to extreme back, shifts the valve gear from forward to reversing position, while the first and last portions

FIG. 6. THE MUFFLER.

of the oscillation simply hold the reversing gear from shifting. Another connection from the rock-shaft operates the throttle, which is closed during shifting of the valve gear and opens gradually after the latter has assumed position. A special feature is a pin, which may be passed through the arm of the seat and the controlling lever when the latter is in mid-position, and locked in place when the carriage is left standing.

The combined muffler and feed-water water heater in shown in Fig. 6. It is located about four inches above the top of the boiler, and the feed water, which passes through the coiled tube on its way to the boiler, is thus heated by the waste gases from the fire as well as by the exhaust steam, while at the same time the latter is to some extent superheated as well.

Side steering, in place of the center steering tiller of the Model A, is now used, and the auxiliary water-pump, instead of being worked by the steering lever, is placed under the body where it can be operated by an extension handle pulled out from the side. The water tank holds 30 gallons, and may be filled by the steam inspirator in Fig. 7. A rubber hose connected to this carries a strainer at its end, which may be dropped into the wayside stream or watering trough and the tank filled without the operator being obliged to leave his seat.

The gasoline tanks are two in number, are of cylindrical form, and are carried

FIG. 7. INSPIRATOR.

under the footboard. They hold 4½ gallons each.

The differential is of the spur-gear type, and is wholly encased. Instead of making the rear axle in divided tubular form, stiffened by a solid round bar through from wheel to wheel, the two live halves of the axle are made solid. To compensate for this structural weakness, the fixed portion of the axle is strongly braced.

The wheels are 28 inches in diameter, with wire spokes and ball bearings, and have 3-inch single tube tires. The brake on the differential has two bands, one on each side of the sprocket-wheel, and is double-acting.

During a carnival held by the Elks last month in Indianapolis, a Waverly electric runabout was raffled off, more than 47,000 shares at ten cents each having been sold. As a money maker the scheme was, it is said, one of the best drawing cards of the carnival.

Two New Electric Vehicle Co. Products.

The accompanying cuts show two of the new vehicles mentioned in these pages last month as being exhibited at the Madison Square Garden show for the first time by their makers, the Electric Vehicle Co. They are alike in having the battery weight equally distributed between front and rear, but are designed for slightly different classes of service. The Seabright runabout, shown in Fig. 1, is intended for city and suburban usage, and especially for the use of business and professional men for carrying them to and from their offices. It has a double motor equipment, with the side steering-lever on the left-hand side, and has two independent motors, each of 1.2 HP. The controller provides three forward and two reverse speeds. The running gear is of the Columbia type, and has a 62-inch wheel base and 48-inch tread. The wheels are 28 inches and 32 inches respectively in diameter, with 3-inch pneumatic tires. The battery is rated at 96 ampere hours capacity, and to give a maximum speed of 13 miles an hour and a radius of 40 miles on one charge. The total weight is 1,675 pounds.

The Elberon victoria, Fig. 2, is intended for light pleasure service and park riding, and for ladies' use in calling, and the like. It has two motors, each of 1.1 H.P., and the details of the controller and battery equipment are identical with those of the Seabright runabout. The running gear is of the Riker type, and the wheel base, tread and wheel diameters are similar to those of the other machine. The total weight is a little over 2,000 pounds.

FIG. 1. THE SEABRIGHT RUNABOUT, MARK XXXI.

FIG. 2. THE ELBERON VICTORIA.

Some Speed Records in France.

The third annual hill-climbing trials at Gaillon were held on Nov. 17th, under favorable weather conditions. The course was one kilometre in length, with a gradient of nearly 10 per cent. for the first two-thirds, followed by an easier rise to the top, giving an average of 8 per cent. for the full distance. The road was perfectly straight, and the trials were run with a flying start, the cars being started about 100 yards behind the line.

The best speeds were made by the motor cycles. Rigal, on a 16-HP. Darracq tricycle, did the kilometre in 50 2-5 s., which lowered last year's record on a Darracq, made by Beconnais by just 5 s. Rigal's mount had a two-cylinder motor. The next best time was made by Osmont on a 10-HP. De Dion tricycle with single cylinder water cooled motor. Time, 51 4-5 s. On a second attempt, using alcohol as fuel, Rigal took 3 s. longer. The 8 HP. tricycles ranged from 54 3-5 to 55 1-5 s. A curious affair, a skeleton of steel tubes, carrying a 2-cylinder Buchet motor of 12-HP., made the climb in 61 s., and a Darracq 12-HP. voiturette in 62 s. Among the large machines the honors were carried off by S. F. Edge on a 50-HP. Napier. His time was 1 m. 3 3-5 s. A Krieger electric vehicle, which, as a long-distance machine, has a record of 110 miles on a single charge, made the hill in 1 m. 15 1-5 s., and could have done better. The Jenatzy combination vehicle, said to have a 60-HP. gasoline engine and a 40-HP. electric motor, did poorly, only 1 m. 53 s., the reasons being said to be a short circuit in the battery. A 12-HP. Gardner Serpollet made it in 1 m. 15 1-5 s., and a Locomobile in 1 m. 34 1-5 s.

A couple of weeks after the official trials above, Rigal, on his Buchet tricycle and Truffault, with the skeleton affair above mentioned, attacked the record anew. Rigal climbed the hill in 42 s., and Truffault did it in 58 s. A week later Rigal, Truffault, and a third aspirant for racing honors, Albert Collins, who drove a 40-HP. Buchet light racing carriage, attacked the straightaway records on the level mile at Parc d'Acheres. Collins did the mile, standing start, in 1 m. 7 3-5 s., and Rigal did the distance in 53 3-5 s., while Truffault needed 1 m. 7 s. The kilometre with flying start was covered in 33 s., 39 4-5 s., and 43 s., by Rigal, Collins and Truffault, respectively. Rigal's record therefore substantially equalled that made in this country by Fournier over the Coney Island Boulevard.

A. Wetterauer, San Francisco, Cal., made a trip with a White steam carriage from San Francisco to Los Angeles, a distance of 525 miles, in six days. During two of the days there was a drenching rain and he crossed three ranges of mountains, some of the grades being, it is claimed, over 30 per cent. The trip was made without an accident.

NEW STYLES OF AUTOMOBILES

The Binney & Burnham Steam Touring Wagon.

The illustration, Fig. 1, shows a steam touring wagon of unusual size, which was built last spring for Mr. Geo. E. McQuesten of the Massachusetts Automobile Club. This machine, though built to seat six, is roomy enough to accommodate three passengers each on the two rear seats, and is arranged so that these seats can be removed if desired, leaving a large space for the accommodation of baggage. The engine, boiler and burner of the vehicle are all of special design. The engine is of the slide valve type with link motion, and has two sets of cylinders, each 2½ by 3½ inches, placed one above the other. The boiler is of steel with a quarter-inch shell, and is 18 inches high by 20 inches diameter. The burner is fitted with the usual automatic regulator set to 200 pounds, and has a pilot light. It is started without the aid of a torch and is claimed to be proof against blowing back. Both engine and boiler are hung on iron frames, and the engine is encased and self-oiling and has plain bearings. A Brown-Lipe spur gear differential is fitted to the rear axle. A double band, double-acting brake acts upon it, and the brake may be "set" at will. A 1½-inch Baldwin roller chain is used. The running gear is flexible, of standard gauge, and has 30-inch wood wheels with 3-inch New York tires and plain bearings. The pressure tanks are of copper, and tested to 200 pounds. The water tank holds about 50 gallons, the gasoline tank 12 gallons and an extra large air tank is provided. An auxiliary steam water pump is provided, and air pressure is maintained by a steam air pump which may be used to inflate the tires. The weight of the carriage is 2,000 pounds, and it has carried a load of 1,800 pounds. It was built by Binney & Burnham, 54 Devonshire St., Boston, and its owner, after using it through the summer, reports that, while he made no long tours with it, it proved very satisfactory for the use to which it was put, which included short runs of two or three days in the country about Boston. It is used also by its owner as an emergency wagon for towing in his other machines when they become disabled.

A Riker Private Brougham.

An electric brougham, on the Riker system, recently built for Mr. Dave H. Morris, according to specifications furnished by him, is shown in Fig. 2. It differs from the nearest regular pattern of the same manufacturers, the Riker demi-coach, chiefly in the symmetrical design of the body. The inside trimmings, of morocco and cloth, are in maroon, and the window fastenings, etc., are silk. The door panels and blinds are painted a rich dark lake, and the mountings, boot and upper quarters black, relieved by a hair line of carmine. The running gear is maroon striped with carmine. The interior is lighted by an incandescent dome light, and an outlet is provided for a footwarmer.

The Prescott Steam Carriage, Model 1.

The illustration, Fig. 3, shows the smaller one of the two Prescott steam carriages exhibited at the Madison Square Garden Show. As was stated in these pages last month, it is normally intended as a two-passenger runabout, and is of medium weight and short wheel base. The box in front is arranged to open out, giving a small front seat, with hinged back and footboard, and will carry two people. The engine is of the usual type, and the boiler is 16 inches diameter by 13 inches high. Air pressure may be pumped up by a steam air pump, started from the seat. The water tank holds 32 gallons and the gasoline tank 12 gallons. Twenty-eight inch wheels, with 3-inch Fisk tires, are used, and the wheelbase and gauge are 60 and 54 inches, respectively. The brake is double acting With tanks filled, the weight is given as 1,150 pounds. The manufacturer is the Prescott Automobile & Mfg. Co., Passaic, N. J.

Elmore Gasoline Carriage, Model 6.

The illustration, Fig. 4, shows the new model 6, Elmore gasoline vehicle. In general appearance it differs considerably from the other types brought out by the same maker. A late design of body has been adopted and the wheel base lengthened. The wheels have been strengthened by heavier spokes, and a Diamond roller chain is used. There are three speeds forward and reverse. It is controlled from high speed by throttle, the action and results being, it is claimed, similar to that of a steam throttle. A dynamo and storage battery for ignition purposes are used, the battery being charged from the dynamo. The Elmore Mfg. Co., Clyde, O., is the manufacturer.

A Rumble Seat Locomobile.

The illustration, Fig. 5, shows a new steam carriage, the first, probably, of its kind to have a rumble seat. It was exhibited at the Madison Square Garden show by the Locomobile Co. of America, and has an extra long wheel base and heavy running gear. The seat is unusually wide, and the body is finished off with a box front instead of the dash. Other details are similar to those of the regular stanhope model with victoria top.

The Clark Steam Delivery Wagon.

In Fig. 6 is shown the new Clark steam delivery wagon. The wheels are fitted with pneumatic Long-Distance tires, three inches in diameter, the rear wheels being 34 inches and the forward 30 inches. American roller bearings are used. The sprocket is in the center of the differential, with double-acting brake at each side.

The engine has two cylinders, 3½-inch bore, with slide valves and link motion, and is fitted with aluminum case so that the engine runs in oil.

The boiler is of steel, insulated with magnesia boiler covering and hair felt. The burner consists of three parts, two main burners controlled by diaphragm regulator; the center, or pilot, which is also used for starting, is controlled by hand. The feed pump is attached to cross-head having full stroke of engine and regulated by by-pass valve. It is also fitted with an inspirator and hand pump, a steam siphon being connected with the tank so that water can be taken while on the road.

The brake is self-locking. The steering handle is in the center, with a single handle for operating the throttle and reverse. The air pressure is maintained by an air pump connected with the engine with diaphragm regulator attached, which can be set to hold the air pressure at the desired point. The vehicle is altogether, it is claimed, strongly built and designed especially for service. The manufacturer is Edward S. Clark, Boston, Mass.

The Automobile Company of America.

Mr. Henry C. Cryder has been elected general manager and treasurer of the Automobile Company of America, Marion, N. J., Mr. Albert T. Otto having resigned the office of vice-president and general manager of the company. Mr. Alexander Fischer, the consulting engineer, has also tendered his resignation. Mr. A. W. King has been appointed superintendent of the factory. The board of directors remains the same, Mr. John H. Flagler retaining the presidency of the company as heretofore. The new addition to the factory has just been completed and new boilers are being installed, which will double the power of the plant. The company reports that it has a large number of orders at present on hand, and is increasing its working force by the addition of new men.

Mr. R. C. Lennie, accompanied by Dr. Bangs, recently made the run from San Jose to the top of Mt. Hamilton, a distance of 28 miles, with a rise of 4,400 feet, in two hours and fourteen minutes. A White steam carriage was used.

FIG. 1. BINNEY & BURNHAM TOURING WAGON.

FIG. 2. A RIKER PRIVATE BROUGHAM.

FIG. 3. PRESCOTT STEAM VEHICLE.

FIG. 4. ELMORE GASOLINE CARRIAGE, MODEL 6.

FIG. 5. LOCOMOBILE WITH RUMBLE.

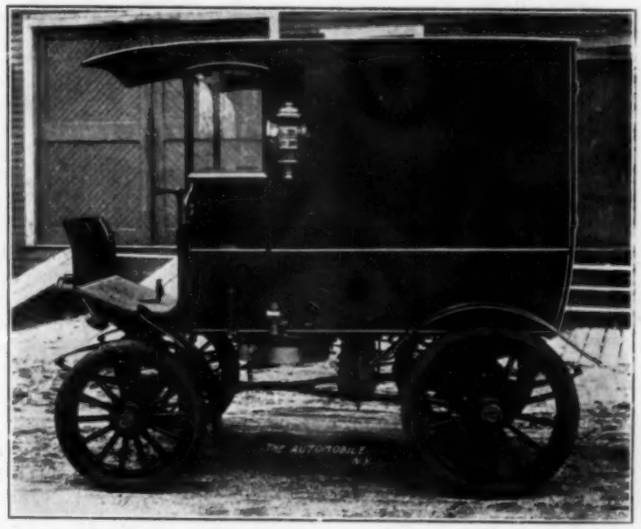


FIG. 6. E. S. CLARK STEAM DELIVERY WAGON.

NEW STYLES OF AUTOMOBILES.

The Automobile

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CONTENTS.

The Automobile for 1902.

THE AUTOMOBILE extends greetings and wishes its readers a happy and prosperous new year. The number of subscribers who have enrolled themselves on the list during the year has been both gratifying to the publishers and complimentary to the paper itself. We take the occasion to assure our readers that no effort will be spared during the present year to furnish them with a journal in every way pleasing and up to date.

The Year 1901.

Looking back briefly, the year just closed has witnessed great progress in the improvement and use of the automobile everywhere, especially in this country. Changes have been made in construction to meet the severe road conditions, and a more serviceable vehicle is the result.

The New York to Rochester endurance run was the most notable contest of the year, and did much good towards furthering the cause of automobilism in general. The unusually trying conditions of this contest showed that the automobile is not a toy or a fair weather vehicle, but that it will run with a certainty of getting to the end of the journey. It enabled manufacturers to discover any weak points in their machines, and the many lessons learned by all who took part were of untold value.

It is true that large sums of money have been expended in experimental work the past year, and while some of the manufacturers, through the constant drain of costly experiment or through mismanagement, will be forced to discontinue operations or consolidate with stronger companies, the development of the vehicle still goes on.

A large number of new automobile clubs has been organized, and legislation has been enacted to insure the rights of automobilists.

Through the Bureau of Statistics of the Treasury Department we are informed that the domestic exports of "automobiles and parts" aggregated $371,876 during the ten months ending with October last, and the imports in the same class during the nine months ending September 30th aggregated in value $99,106. Imports are reported to the Department quarterly, and the dates given are the latest for which statistics are available. This shows a very gratifying balance of trade in favor of the manufacturers of this country. There has been considerable discussion during the year to the effect that too many automobiles were being imported into this country, and some manufacturers have expressed uneasiness on the point. The figures given, however, speak for themselves, and should settle once for all that we have little to fear from foreign competition even at this stage of the art.

Clearing the Air.

It is rumored that certain bills are to be introduced this winter in the New York State Legislature, aiming at stricter control of the speed of automobiles. Although we have no particulars at present, it is reasonable to suppose that the measures contemplated will take the form of amendments of the Doughty law, passed last year, in which speed limits lower than eight and fifteen miles an hour in built-up and open sections respectively were prohibited. Presumably the new amendments will take the form of reduced speed limits, or of severer penalties than the maximum of $25 fine now in force, or of both.

As our readers know, we have never sympathized with the demand for lower speed as such. There are plenty of open country roads on which speeds of twenty-five or thirty miles an hour could not possibly harm or inconvenience any one, and there are many built-up streets on which traffic is so light that a dozen or fifteen miles an hour could be reached with safety. The pernicious and demoralizing effects of an unreasonably low speed limit are well illustrated by the late experience of our English cousins, as indicated in another column. What is needed is not a compulsory reduction of speed to a crawl, but more considerate driving and a stricter observance of the rules of the road.

This is not a new subject, but it is a very live one, and it will never rest until it is settled in the right way by automobilists themselves. There is plenty of reckless driving which endangers no one but the foolhardy chauffeurs themselves, but with it is an appalling amount of cold-blooded, deliberate disregard, engendered by the possession of superior weight and speed, of the rights of other users of the road. Such performances as driving full tilt through a city street, blowing the horn and forcing all other traffic to the curb, cannot be explained away by any talk about the beautiful controllability of the motor vehicle; and yet such incidents are almost too common to excite comment. Every suburban road has seen the motor hogs who refuse to give half the road, and force horse drivers, and even cyclists, into the ditch. We heard the other day of a man driving a touring car, with a party of ladies aboard, straight toward a child playing in the street, blowing his horn the while, when there was ample room to have gone around quietly. The child's escape—it saw the vehicle just in time, apparently, to get out of the way—was probably less narrow than it seemed, but that did not make the driver's act less criminal. Such outrages should be made punishable, not by fine, but by imprisonment for a term of months, and a similar penalty should be visited on the numberless smaller, but equally wanton offences of those who can-

not otherwise be taught that superior momentum does not carry with it exclusive rights on the road.

A few convictions under such a law would do wonders toward clearing the air, and for the sake of the motor vehicle's future we hope that such automobile legislation as is enacted this winter will be directed at the real evil, and not waste itself on unenforceable speed limits.

National Club Affiliation.

The plan proposed by the A. C. A., as outlined in these pages last month, for an affiliation of the automobile clubs of the country, has been the subject of much animated discussion. Naturally, the first question to arise with the clubs asked to join was that of the benefits to be had by such affiliation, and the plan as originally submitted has met with considerable opposition. No one denies the value of the work done by the A. C. A. in fostering the sport and industry in this country. It has the prestige of seniority, the wealth, and the social attributes, but we are confident that it will not lose sight of the fact that in order to effect a consolidation to advance the cause of automobilism in its truest sense, every club must have due representation. This is in accord with true democracy. A national organization can and should be formed which will be representative in character and strengthen the cause of automobilism everywhere. We are glad to note, as we go to press, that negotiations are still in progress, and we feel sure that a plan will be formulated which will be acceptable to every club invited to the federation. A disruption at this time, especially among the larger clubs, would indeed be unfortunate.

The Weight Limit.

Last spring the Automobile Club of France announced that, after the Paris-Berlin race, all gasoline vehicles competing in races under its auspices, except in the international race for the Gordon-Bennett cup, would be subject to a weight limit of 1,000 kilos., or practically one (long) ton. This limit has now been extended to the Gordon-Bennett cup races by, we believe, the consent of all the national organizations likely to compete for the cup. We are glad to believe that this agreement marks, for the present at least, the end of the tendency to seek increase of speed through increased power and added weight. This tendency was rapidly resulting in the production of unwieldy monsters, very fast, it is true, but wholly unsuited for touring purposes. Admirable in a race over an open road, their combined weight and bulk were such as to make their use on the common highway, at anything approaching the speeds for which they were intended, simply inadmissible. Speeds which with a light and quickly controlled machine might be tolerated, would be out of the question in a vehicle weighing, with its passengers, over a ton and a half. It is probable, too, that the touring vehicle will profit more quickly and directly by refinements in the design of the racer, when the latter is somewhere near it in point of weight, than when the racer could weigh double as much as its more useful companion.

But the benefits of the weight limit do not end with better public feeling or improved design. The tire problem is to-day the most serious constructive obstacle in the way of popularized high speeds. Even were the vehicles themselves mechanically perfect, the public and horses fully schooled, the speed laws liberal, and the roads good, average speeds in excess of eighteen of twenty miles an hour would still be for the few, a pleasure not to be aspired to by the man whose motor vehicle must cost no more than the horse it replaced. The largest single item in the upkeep of racing vehicles to-day is the tire bill; it is also the largest item, it is safe to say, in the expense account of any high-class touring vehicle weighing, as most of them do weigh, in the neighborhood of 2,000 pounds, and speeded to twenty-five miles an hour, or more. Load and speed are the principal factors in tire destruction, and—since any form of "solid" is out of the question here—high speed bespeaks low weight as a sine qua non of tire economy.

It has been shown that the "light voiture" of France, weighing in the neighborhood of 1,000 pounds, is for touring purposes but little inferior in speed to the most powerful racer. Doubtless its life is shorter; but its cost is far less. It is more easily handled, more easily cared for, and more cheaply repaired: and in point of tire expense there can be no comparison between the two. What ever tends to assimilate the racer to the medium and light-weight pleasure vehicle is a direct benefit to the latter.

It is said that the heavy vehicle rides more easily than the light ones. But this is very largely a matter of wheel base, and usually the comparison is between a long racer and a short runabout. Cut the weight of the racer in half, while preserving its wheel base, and it is merely a matter of springs to make it as comfortable as before. The heaviest vehicle imaginable may make its passengers wretched if its wheels are too close together and the road is rough.

The Course of the Auto in England.

As our readers know, the automobile has had to contend in England against a greater vis inertiae of antiquated speed legislation, police hostility, and stubborn, fatuous, complacent public ignorance combined, than in any other country where it has become a measurable force. The man in the street, the man behind a horse, and the guardian of the law alike have welcomed the automobiling stranger with a cheerful proposal to "'eave 'arf a brick at 'im," and have joined in the man-hunt with a gaudium certaminis of much the same variety as 'nspires the younger generation to pursue and pelt a homeless dog. If there was ever a time when it seemed fair to suppose that the automobilist was the chief offender, recent events certainly seem to show that this idea was needlessly flattering to the British public at large. Every week brings its grist of "furious driving cases," and these, instead of growing fewer in number with the unremitting police crusades, are steadily more numerous. On the face of it, it would seem somewhat strange if the scorching motorists were continuing to defy public sentiment and the law, wantonly and at the imminent peril of arrest and fine; and an examination of the evidence in these cases shows that, so far from the victims of police activity having endangered, or even annoyed other users of the roads they are usually mulcted on a merely technical violation of the ten-mile speed limit, or are charged with driving "to the common danger" when no one but the officer was in sight, or are even convicted on badly manufactured testimony, or on the crude guess of a constable with no more ability to estimate the speed of a vehicle than to drive it. There is no appeal from these hostile local courts, except on points of law, and where evidence conflicts the constable's word is always taken. Starting out with the idea that a man becomes in effect an outlaw as soon as he gets into a motor vehicle, no more convenient means of treating him as such could be imagined than a technical construction of the English highway law.

The real hollowness of the anti-motor crusade has been well shown of late, through the organizing of motor and cycle patrols on the principal roads out of London. Equipped with flags for signaling, and with kodaks and stop-watches wherewith to obtain evidence in the case of police ambushes, these patrols were able to break up completely the "sport" of the "bobbies," with the result that the roads in question were freer from gratuitous annoyance and hidden dangers than at any time in many months.

Strange to say, the sympathies of the public, on these occasions, proved to be wholly with the patrol and its beneficiaries, and this was, perhaps, the most significant feature of the whole affair. With the public in general beginning to take an interest in seeing fair play, it will not be long before the bear-baiting tactics of the constabulary will be seen in their true light, as a waste of taxpayer's money and a neglect of legitimate police duties.

CLUB NEWS AND VIEWS

Club Directory.

Automobile Club of America, S. M. Butler, Secy., 753 Fifth Ave., New York.

Automobile Club of Baltimore, W. W. Donaldson, Secy., 872 Park Ave., Baltimore.

Automobile Club of Bridgeport, F. W. Bolande, Secy., 49 Cannon St., Bridgeport, Conn.

Automobile Club of California, R. R. l'Hommedieu, Secy., San Francisco, Cal.

Automobile Club of Cincinnati, R. H. Cox, Secy., Cincinnati, O.

Automobile Club of Columbus, C. M. Chittenden, Secy., Broad St., Columbus, O.

Automobile Club of Maine, Henry M. Jones, Secy., Portland, Me.

Automobile Club of New Jersey, W. J. Stewart, Sec'y, 8 Central Ave., Newark, N. J.

Automobile Club of Rochester, Fredk. Sager, Secy., 66 East Ave., Rochester.

Automobile Club of Syracuse, Frederick H. Elliott, Secy., 515 S. A. & K. Building, Syracuse, N. Y.

Automobile Club of Utica, Jas. S. Holmes, Jr., Secy., Huron Building, Utica.

Bloomsburg Automobile Club, C. W. Funston, Secy., Bloomsburg, Pa.

Buffalo Automobile Club, Ellicott Evans, Secy., Lenox Hotel, Buffalo, N. Y.

Chicago Automobile Club, H. M. Brinckerhoff, Secy., Monadnock Block, Chicago.

Cleveland Automobile Club, Windsor T. White, Secy., Cleveland, O.

Columbia College Automobile Club, Lewis Iselin, Secy., Col. College, N. Y.

Dayton Automobile Club, E. Frank Platt, Secy., Dayton, O.

Herkimer Automobile Club, W. I. Taber, Cor. Secy., Herkimer, N. Y.

Hudson County Automobile Club, F. Eveland, Secy., Jersey City, N. J.

Indiana Automobile Club, August Habich, Secy., Indianapolis.

Long Island Automobile Club, L. A. Hopkins, Secy., 1190 Fulton St., Brooklyn.

Massachusetts Automobile Club, Dr. F. L. D. Rust, Secy., Ashburton Pl., Boston.

National Capital Automobile Club, W. J. Foss, Secy., 819 14th St., N. W., Washington, D. C.

New Bedford Automobile Club, E. G. Watson, Secy., New Bedford, Mass.

North Jersey Automobile Club, E. T. Bell, Jr., Secy., Paterson, N. J.

Pennsylvania Automobile Club, H. J. Johnson, Secy., 138 N. Broad St., Philadelphia.

Philadelphia Automobile Club, Frank C. Lewin, Secy., Hotel Flanders, Phila., Pa.

Princeton University Automobile Club, Chas. H. Dugro, Sec'y., Princeton, N. J.

Rhode Island Automobile Club, F. A. Fletcher, Secy., 42 So. Water St., Providence.

San Francisco Automobile Club, B. L. Ryder, Secy., San Francisco, Cal.

St. Louis Automobile Club, John Ring, Secy., St. Louis, Mo.

Troy Automobile Club, J. S. Thiell, Secy., Troy, N. Y.

Worcester Automobile Club, H. E. Sheiland, Secy., Worcester, Mass.

Automobile Club of America.

The following standing committees have been appointed for 1902:

Technical Committee. — Dr. Schuyler Skaats Wheeler, Chairman; Peter Cooper Hewitt, Louis Nixon, Louis Duncan, L. T. Gibbs, E. T. Birdsall, A. L. Riker, Prof. Elihu Thomson.

Runs and Tours.—Jefferson Seligman, Chairman; George B. Adams, Frank Eveland, John Aspinwall, J. C. McCoy, Percy Owen.

House Committee.—J. M. Hill, Chairman; William Iselin, Bradford B. McGregor, Samuel H. Valentine, Henry K. Browning.

Library Committee.—Albert R. Shattuck, Chairman; James L. Van Alen, T. C. Martin.

Membership Committee.—Gen. George Moore Smith, Chairman; Juan M. Coballes, Sidney Dillon Ripley.

Laws and Ordinances.—Geo. F. Chamberlin, Chairman; Judge Jas. G. Church, Dave H. Morris, Henry Rogers Winthrop, William W. Niles, Morris Putnam Stevens.

Sign Post Committee.—A. Ward Chamberlin, Chairman; Geo. B. Adams, Frank Eveland.

Good Roads Committee.—Albert R. Shattuck, Chairman; George R. Bidwell.

Committee on Foreign Relations.—J. Dunbar Wright, Chairman; Clarence Gray Dinsmore, Hart O. Berg, Eugene Higgins.

Racing Committee.—Albert C. Bostwick, Chairman; Dave H. Morris, Clifford Brokaw, William Henry Hall, George Isham Scott.

Auditing Committee.—Geo. W. Young, Chairman; W. M. Van Norden, W. McMaster Mills.

The racing committee recently announced the following amendments to the racing rules of the club:

Amend Rule 53 to read as follows:

"53.—Once in the hands of the starter, no automobile shall receive any further care, except from its driver, or his assistant."

New Rules:

15a.—In record races and contests, automobiles shall be classified according to weight.

15b.—Bicycles, tricycles and tandems shall not compete against four-wheel vehicles.

63a.—During the running of a contest or record race, the driver must have exclusive control of the steering and power of his automobile.

67a.—No time shall be considered official unless the time is taken by an official of a "Recognized Meeting," or by one appointed subject to the approval of the Racing Committee.

Mr. Hart O. Berg read a paper at the meeting of the club Dec. 5th, which is given, somewhat condensed, on another page of this issue.

Mr. A. Ward Chamberlin, chairman sign and post committee of the A. C. A., will soon start on a tour of the state in a crusade the governors of the club have decided to begin in the matter of guide posts. The law compels the commissioner of highways to erect sign posts at road crossings on the petition of twenty-five property-owners of the county. The law provides for a fine of $25 in the event of the commissioner not erecting the post within sixty days after the receipt of the petition, the fine to go to the sign post fund of the county which is compelled to pay the expense in the erection. Bicyclists and horse owners, as well as automobilists, are equally interested in the matter. As the A. C. A. has discontinued the work of putting up signposts by private subscription, it will also co-operate with the Highway Alliance in obtaining enforcement of the laws of the state. Under this arrangement tourists and all others interested are urged to communicate with the secretary of the A. C. A., 753 Fifth avenue, or the Highway Alliance, 206 Broadway, New York, regarding points where signposts are needed, and these organizations will then take action to get the necessary signatures to a petition

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Long Island Automobile Club.

At a meeting of the Long Island Automobile Club, December 11, the following officers were elected for the ensuing year: President, W. Wallace Grant; vice-president, Edward Pidgeon; treasurer, Frank G. Webb; secretary, Louis A. Hopkins; board of governors: Nathaniel Robinson, M. D., Louis R. Adams, C. J. Field, John W. Newberry, Edward Pidgeon and A. R. Pardington. The committee on admissions, elected at the same time, comprises Charles Rockliff, A. N. White and H. R. Perkins.

After the meeting, the members adjourned to the Union League Club for the annual club dinner. In the course of the speeches that followed this repast, the recent proposition sent by the A. C. A. to the local automobile clubs of the country, inviting them to join in a national affiliation, was frankly criticised, the sentiment of the members being that the control of racing affairs should be shared among the several branches of the association, instead of being centred in the A. C. A., as proposed by that body. With this reservation, the idea of a national body, in which the several local clubs should be represented by delegates, and which should

make rules to be followed by all the clubs accepting the same, was cordially approved.

The club voted to meet once in each quarter, during the season, for dinner and discussion of live topics.

The Chicago Automobile Club.

The club held a smoker at the Sherman House during the early part of December. Some forty members were present. An informal entertainment was given, and it is proposed to have this a feature of subsequent meetings. A number of new members have been recently added, and the club is in a growing condition. Another meeting will be held in the early part of January.

Rhode Island Automobile Club.

The first annual banquet will be held at the next general meeting which will take place early in January. A committee consisting of Walter Sturges, R. Lincoln Lippitt, and Dr. J. A. Chase has been appointed to make the necessary arrangements.

Automobile Club of New Jersey.

Through the action of the club and its secretary, Mr. W. J. Stewart, the Park Commissioners of the County of Essex recently voted to allow the privileges of the park roads to automobilists. The good roads in this section of the country and the freedom accorded will tend to make the use of automobiles more popular than ever. Following are the rules:

1. No automobile or horseless carriage will be allowed upon any park without the owner first obtaining from the secretary of the board a permit and registering his name with the secretary, nor unless such vehicle bears the number of its license in Arabic figures, not less than two inches in height, in a conspicuous manner on the rear of said vehicle, and not less than one inch in height on the lamps of said vehicle.
2. The speed of such vehicle shall be limited to the rate of seven miles an hour, except on curves, where the speed shall not exceed five miles an hour.
3. Where horses become restive or frightened at the approach of an automobile, the operator shall bring the vehicle to a full stop until the horse can pass.
4. Operators of automobiles must not sound the gong except at the intersection of crossings.
5. Holders of permits must exhibit them on demand of park guard or official.
6. In the event of violation of any of these rules, the permit of the offender will be withdrawn, and he will be denied the use of the parks.

The Automobile Club of California.

Much enthusiasm and energy is being displayed by this club. President F. A. Hyde recently made a trip through the eastern states and reported to his club the regulations governing the admission of automobiles to the parks of the leading eastern cities, and it is hoped to get similar regulations adopted in San Francisco. The club has secured a large room on the fourth floor of the Cliff House for the use of automobilists and where its meetings will be held. A luncheon will be served Sundays between noon and two o'clock. The regular monthly meetings of the club will be held on the night of full moon. A number of interesting club runs are proposed. The club has a membership of about eighty, with an increase of about twenty a month.

Automobile Club of Bridgeport.

The club has established permanent headquarters at 150 Cannon St. The new quarters are spacious, and ample provision has been made for storage and repair of the vehicles of members. The outlook for the coming season is very promising.

The Automobile Club of Maryland, Baltimore, Md., opened its new club house on Dec. 9th. The club has a good membership, the number of machines owned by members being nearly fifty.

The Springfield Automobile Club, Springfield, Mass., proposes to hold a tournament at Hampden Park in the latter part of May.

A Club Metamorphosis.

The Automobile Club of France has practically completed negotiations for an amalgamation with the French Yachting Union. In explanation of this step, it is stated that no French club can live and grow properly without the incidental attractions of gambling. This diversion has not thus far been permitted to members of the A. C. F. in the quarters of that club, and this fault, it is said, will be rectified under the new order of things. The A. C. F., however, will not entirely lose its character as a "society of encouragement" of the sport and industry, as an offshoot from it will be created, which will be run upon lines of the old club and retain the democratic character which has heretofore distinguished the parent organization.

A Small Electric Auto.

Master George Jay Gould, Jr., was the recipient, from his mother, on Christmas Day of a miniature electric automobile, complete in every detail. It was built by Cole & Woop, of New York City, and designed by Mr. J. O. McDonnell. The dimensions are given as follows: Total length 4 feet; body 3 feet 3 inches by 1 foot 7 inches; height to seat 2 feet; weight 200 pounds; wire wheels, 20 inches rear, 16 inches front, with 1½-inch pneumatic tires. Its power is from a 10-cell storage battery which develops ¼ HP. It has three speeds from five to seven miles an hour, and the battery is stated to have a capacity of twenty miles without recharging.

Notes: Here and There.

A decision has been rendered by the United States Court of Appeals sustaining the Tillinghast single tube tire patent which has been in litigation for several years. The decision is on an appeal from a ruling made by Judge Colt, November 14, 1899.

Albert C. Bostwick has entered for the Paris-Vienna race of 1902. W. K. Vanderbilt, Jr., and Foxhall Keene will also represent America in this race, as already announced. Mr. Bostwick, it is understood, has ordered a new four-cylinder Panhard especially for the race.

A rate of a fare and a third for the round trip has been secured from the Central Passenger Association for the Chicago Automobile Show. This rate is contingent upon the sale of at least one hundred certificates, but it is thought that there will be little difficulty in getting the number required.

It is reported that a company organized in Flagstaff, Ariz., has under consideration the establishment of a line of steam automobiles to run from Flagstaff to Grand Canon, a distance of 72 miles. The feasibility of the plan is soon to be tested by Mr. Oliver Lippincott, of Los Angeles, with a specially constructed machine.

Among the members of the Rhode Island Automobile Club, the following have ordered new 20-HP. Wintons, to be delivered in March next: Howard Sturges, R. Lincoln Lippitt, Arthur E. Austin, Henry E. Lippitt, and Joseph E. Fletcher. It is proposed to get up a speed contest among the owners when the new machines arrive and have been tested.

The speed limit for automobiles in Camden county, New Jersey, is ten miles, and any one who runs his vehicle at a higher rate of speed is subject to a fine of $20, one-half of which goes to the informer. This throws temptation in the way of any one who, for the sake of getting $10 may cause automobilists no end of trouble. The law should be repealed or modified, if for no other cause than public morals.

An opinion by Judge Coxe, of the United States Circuit Court, sitting in Utica, N. Y., December 19, was filed in the case of the Electric Storage Battery Co., against the National Battery Co., American Bicycle Co., and Eugene W. Belknap. The judge, in this opinion, sustains the validity of the Electric Storage Battery Co.'s patent, enjoins the National Battery Co. from further manufacture and sale, and also enjoins Mr. Belknap from the further use of his electric vehicle equipped with the battery.

The Automobile Industry Abroad.*

Among the world's best examples of evolution I would say that that of the automobile has been more rapid than any other recent mechanical development. This advance has not been without costly trials and experiments and a concentration of thought which, first finding its encouragement in France, still continues, and this, with your permission, to hold the lead in that country. This is but natural. The topographical conditions of France lend themselves so well to the development, not only of speeds and flying runs, but to long and continued excursions, which, added to the exhilaration of moderate speed, make touring both possible and enjoyable.

Less than ten years ago the late M. Levassor (whom I had the pleasure of knowing personally very well, and whom I believe to be the real father of practical automobiling) using, as he did at that time, the hydrocarbon motor of Herr Daimler, tried again and again to construct a mechanically propelled vehicle that would carry him but once around the fortifications encircling Paris without necessitating his stopping for repairs, or without his having some exasperating accident of one kind or another. This was the then herculean task he had set himself, and it took him almost two years of constant labor, trial and experiment, to fully accomplish this now almost ridiculously insignificant run. It was Mr. Levassor who first conceived the idea that is, as far as I know, of putting the motor in front of the dash, and I believe that this disposition of the motor, and the distribution of the mechanical parts of the carriage which necessarily follows, was what encouraged to ultimate success the various refinements which Mr. Levassor afterwards worked out.

The field was a virgin one at that time, and every detail of his vehicle had to be developed organ by organ, until now the trip from Paris to Bordeaux, as you all know, has been taken without one single breakdown, or stop of any kind, except for fuel; and long runs of several hundred miles without the slightest inconvenience must prove to you that the automobile, as exemplified in the French type of to-day, has at least arrived at a practical type.

I may say a word here about the peculiarities of the French, with whom I have been living for many years and whose minds I greatly admire. The French are most prolific in ideas, and have a power of concentration almost unlimited. No sooner is one machine built by a Frenchman than another is immediately planned by him to contain corrections and more recently developed practices, each individual inventor working well within the lines undertaken by him, and each one seemingly quite content to bring to perfection a specific organ or unit of the machine, disregarding in a measure the vehicle as an entity led on, as it were, by the gratification experienced by him in realizing the perfect working of one particular element or unit of the vehicle. In other words, the French automobile of 1901 is not the result of work of any one man or firm of builders, but the type has been practically worked out unit by unit by specialists, who have made each particular organ a study of their own.

For instance, M. Lemoine, the head of the largest firm of French axle builders, has made a specific type of axle and hub which seems to meet the exigencies of road runs. Michelin has developed a tire, as you all know, to meet the conditions of the weights of French carriages and the peculiar roads which run through France. Longuemare has developed a carbureter of the float type, which has long been recognized as standard. Bouton, of the De Dion, Bouton & Co., even to-day can be seen from 7 in the morning to 7 at night in his blue blouse, superintending the manufacture of thousands of motors of the high-speed type. Buchet has made a special effort to reduce the weight of high-speed motors, and the little 20 HP. 4-cylinder motor which he manufactured for Santos Dumont, and which was used so successfully in all of Santos Dumont's experiments, weighed, I believe, but 82 kilos, and I am told that he actually got 24 brake-horse power out of this motor.

I might go on and enumerate to you the names of men in France who have in this way specialized and developed each particular organ of the now recognized types, and it is largely on this account that the French are to-day building carriages from which the element of experiment has been eliminated.

I think I now dare go on, even though you may have received from me the idea that I am convinced that the automobile must come from France. I shall, I am sure, before I finish my remarks this evening, convince you that the real home of the manufacture of automobiles will be in this country, and if you will allow me to lead up to this gradually and with some patience, I may be able to show you my reasons for believing that America will come forward with bounds and leaps as she always does, and will ultimately control the automobile-purchasing markets of the world.

Now, if you will allow me, I shall start by recalling to you that there are three distinct types of automobiles manufactured in France to-day: the steam, the electric and the gasoline-propelled.

In 1889 I spent most of the summer in Paris at the Universal Exposition, held there in that year, and I was much impressed, as was everybody, with the boilerless steam engine of M. Serpollet. In a small pavilion on the banks of the Seine, M. Serpollet showed his little engine running, pounding, generating power, and using, as you all know, his capillary tube system. M. Serpollet was not long in building a motor carriage in which he incorporated his little piece of copper tube. Unfortunately, the capillary hole soon became clogged. It was enlarged, and afterwards a series of tubes was used. Then M. Serpollet made a carriage with a device ingenious enough, regulating the supply of fuel and the supply of water, the relation of the proportions of these supplies being controlled by one lever. Years afterwards, I bought a Serpollet carriage. I have never had so much fun with anything in my life. Sometimes it ran up-hill in a beautiful way, sometimes I had hard work to run it down-hill. The tubes kept flooding. I developed muscle in my right arm, with which I was forced to do a little additional pumping now and then, but I found a good opportunity of selling this carriage to the Shah of Persia, and I have no doubt that some of his numerous wives are now having lots of fun with it in Teheran.

This is about the only steam carriage, other than those for heavy traction (to which I shall refer later), which has appeared in France. It runs through the streets noiselessly and is easily controlled, but I found that one not only had to have a knowledge of mechanics to run it, but had also to be on the constant alert at every change of grade, when more or less water or more fuel had to be sent to the flash tubes, and instead of my looking at the scenery and enjoying the fresh breeze, the air often became blue about me, and I became very tired of focusing my eyes on the jumping steam gauge. I have seen very few other steam carriages of the light type running through the streets of Paris.

I now come to electric carriages: Gentlemen, I have been brought up on them. I have seen them through their measles and their scarlet fever. I have seen them go through all sorts of experiences in the charging stations, but I must say that during the five years that I have run an electric carriage through Paris (and I was one of the first to have an electric carriage there, and that an American one), I have never had but once what the French call a "panne." This was caused by a bolt falling into the motor and breaking a connection.

I may also tell you here of rather an amusing incident which helped to enliven a fete given some years ago at the Automobile Club Pavilion in the Bois de Boulogne. I had the pleasure of taking out Baron Von Zuylen in my Columbia carriage to this fete. There was a number of electric carriages drawn up in the garden of the Automobile Pavilion, and while we were at dinner, we were startled

*Condensed from an address by Hart O. Berg before the Automobile Club of America, New York, Dec. 11.

by a sudden cry of fire. It had come on to rain very heavily, and the downpour, getting into one of Krieger's batteries, made a short circuit, causing his carriage immediately to burst into flames.

But these are all reminiscences, and Krieger soon found a way to protect his battery. To-day the Krieger type of electric carriages for coupes, victorias, landaulets, etc., is well established in Paris, and they have, I should say, perhaps 150 of them running about the streets. You will remember perhaps that this type of carriage has the steering and driving wheels in front; there are two motors, compound wound; the batteries are divided, part of same being in front and part in rear. The controller is a vertical one, having, I believe, at present 7 positions, 4 ahead, one braking position and two backward. The controller is of the recuperative type, and I believe works very satisfactorily. The control is hand-operated, and the lever is immediately beneath the steering wheel. This makes it very handy and quick in action. The front steering wheels with their attached motors, which now, by the way, are being hung on springs, are necessarily very heavy, and a big reduction in the steering gear is required. Pneumatic tires are used entirely on the front or motor wheels while solid tires are being used on the rear wheels.

The Jenatzy type of vehicle is chain-driven, although this company has manufactured some carriages with two motors driven from the rear, as we are accustomed to see here. Their distinctive feature, however, is a foot control, in addition to the hand control; that is a lever worked by the foot throws in more or less resistance and consequently regulates the speed of the carriage. We all remember also the Jamais Contente, constructed by Jenatzy, in which the motors turned the wheels directly, without any gearing. I saw this carriage at one of its trial speed runs (it was only constructed to go one or two kilometers), and it seemed to jump over the ground very much like a kangaroo. I should say that it was in the air at least one-quarter of the time.

The firm of Jeanteaud & Co. have also constructed a number of electric vehicles, but rarely more than one or two of the same type, all of which, however, have features about them of the more or less automatic, interlocking, can't-make-any-mistake variety. Jeanteaud's motor has usually been hung on a frame, and the carriages have been chain-driven.

There have been several other electric carriages built in Paris. Perhaps M. Mildé has made more practical types than any other French manufacturer. These are more or less taken and modified from the lines laid down by the Columbia electric carriage, of which there are a great many now running in France.

If you will let me here say a word about batteries, I simply wish to recall to you the much-talked-of Fulmen type, which has very large capacity and more or less limited life. The Plante system has been almost entirely abandoned, as this type is too heavy for electric road traction. The Heinz and the Aigle battery, both being of the pasted plate type, are perhaps now used more than any others.

Mr. Philippart raised quite a commotion three or four years ago by putting on the market a pasted battery in which he used pencils of active material instead of plates. Each pencil was surrounded by hundreds of small ebonite washers, and these washers prevented the active material from falling off. This was a most expensive type of battery to build, but it certainly did give very good satisfaction for two to three hundred discharges. The active material did not fall to the bottom of the jar, but after two or three hundred discharges it shrank away from the electrodes, and destroyed the contacts. I know of one of these batteries which has been in use for three years, the original capacity of which was 120 ampere hours. It will now give from 40 to 50 ampere hours. Nothing in the battery has ever been touched. But of course it is out of the question to think of manufacturing these batteries and using them, for the cost, as I have stated before, is too great, and on account of its construction, it is impractical to repair them.

The common pasted plate battery, such as is now produced by Heinz, one of the largest manufacturers, seems to work very well, is very cheap, and the positive plates can be changed at a small cost. Batteries of this type, weighing under 500 kilos. at a discharge of 20 amperes, have a capacity of about 140 ampere hours.

A good feature of most of the French batteries, and one which has always recommended itself to me, is that each element of the battery is attached to its neighboring elements by nuts and bolts. This practice, I believe, was given up in this country, but they have carried it to perfection in France, and when an element for some cause or another goes down in capacity, it can easily be removed and replaced by a new one, not necessitating any burning together, as was the practice at one time.

Let me divide gasoline vehicles into two types, the carriage and the so-called voiturette.

The carriage type has come to stay. It is almost perfect to-day, while the voiturette class is still undergoing constant changes. The carriage type, or heavier vehicle, has been the more successful, as makers could put weight into their carriage, and in order to run at the now desired speeds, weight it what is necessary.

The motors now being used in carriages of this type are so-called slow running, the number of turns per minute, without acceleration, being limited to about 800, and in motors where the stroke is short the number of turns can be accelerated up to 1,100 and 1,200 a minute, without danger of pounding. There has been a gradual cutting down of stroke recently, the diameter of the cylinder and the length of stroke in many instances now being almost square. Almost all the successful motors of to-day are of the vertical type, and are placed in front of the dash. Two cylinders are used almost universally in carriages developing up to 8 HP., and four cylinders above this. The inlet valves are so arranged as to be easily removed and examined; the exhaust valves, made of a special steel, are so arranged as to be readily taken out; the pistons are all fitted with oil grooves; bearings of the crank shaft are large; in fact, all the bearings of the motor are exaggerated in every way, and on this account have long life, and are not likely to heat. With a few rare exceptions, two-cylinder motors are governed. Governors are usually of the ball type.

The change gear most popular in France, that is the sliding train, we all agree is not mechanical. But by the experience which has come with the actual working of these change gears, they have been able to develop them into something most practical; show the ordinary mechanic a gear changing device in which there is a sliding train; he usually throws back his arms and looks with utter horror at this childlike construction. But, gentlemen, they work, they run well, the gears do not strip. I have a carriage here now, in which I have run over 10,000 kilometers and in which the gears have never been touched.

The carbureter is so simple that I need hardly refer to same. You all know it well. That which is used almost exclusively to-day is of the float type, and gives very little trouble. Recently the idea of hot tube ignition is being given up. On all of Panhard's new carriages there are no hot tubes; they rely entirely on electric ignition, the various organs of this electric ignition being so perfected at present, as to secure entire reliability. The magneto and make and break spark, have been adopted by Mors and on most of the German carriages.

The other type is the ordinary jump spark, some using vibrators to produce this, others using a simple contact breaker. In every type of carriage the point of ignition can be varied by hand, though in some it is automatically taken care of. Personally, I prefer the hand regulation, although I have run for miles over undulating country without ever thinking of changing the time of ignition.

The so-called pedal control has been almost universally adopted in France. There are two pedals, the left-hand one releasing the clutch, while the right-hand one releases the clutch and then brakes.

The hands are, therefore, always free for steering purposes, and as the steering is done with a wheel and is non-reversible, except when very high speeds are obtained, the steering can be done very readily with one hand. The change gear is worked by a lever, convenient to the right hand.

And this brings me to a question. Is it better to sit on the right or on the left-hand of a carriage? In France the right-hand seat is, with one exception, universal, and I see no reason why they should not continue to sit on the right; the change gear lever and emergency brake can be manipulated very energetically and more quickly by the right hand, and I do not see why it should be necessary to sit on the left in order to see round the carriage you are passing.

But little attention has been paid in France to the muffler. People have become accustomed to the puff-puff of the exhaust; horses are no longer frightened, and in muffling the carriage too much, there is some back pressure which naturally detracts from the maximum power of the engine. I have often heard French carriages called "noisy." I believe that they can all be muffled down to be as noiseless as can be wished; this, of course, as I have just said, with a slight reduction of the maximum power of the motor.

The oiling devices are now taken care of automatically. When the motor is set in operation, oil is sent to the various parts of the carriage needing it, while grease is forced through tubes under pressure to the several bearings of the carriage needing same. I have seen in several German carriages automatic oilers, relying upon the water pressure made by the circulating pump. Now, sometimes the pump does not work properly. It is just at this time that you need more oil than at other times; therefore, I believe it is a mistake to have one dependent on the other. And while on this subject of pumps, I may tell you that the gear pump is not in great favor in France; the high speed centrifugal pump, run by friction from the flywheel, has been adopted almost universally. The flanged radiator seems to give perfect satisfaction, although the Germans have put on some of their carriages the bee-hive radiator, cutting the supply of water down very considerably. But our French friends argue this way against the bee-hive radiator. Suppose it takes 60 litres of water to cool an engine using a flanged radiator, and only 7 litres to cool an engine where a bee-hive radiator is used. If everything always worked perfectly, there could be no question, and the bee-hive radiator, although it costs more, would be preferable, but if there be a small leak somewhere, if one of the joints in the water circulation be bad, it might take three hours for the water to leak out of a 60-litre tank when the same leak in the 7-litre tank would leave the tank dry in less than half an hour. Some day, I have no doubt, the water circulation, pipes, joints, etc., will be so perfected as to allow of the bee-hive or other similar radiator being used.

The second type of gasoline carriage, the voiturette, is still too young to be considered final. In these voiturettes the general practice has been to use one motor of the high-speed class; indeed I have seen carriages with one motor, in which the engine turns normally at 1,500 to 1,800 revolutions. This represents a tremendous piston speed, and a consequent wear which to my mind is not practical. In carriages of this type, the speed is controlled entirely by the mixture and advance and delay of point of ignition. Instead of being driven by chains, voiturettes are almost entirely driven by the main shaft direct through bevel gears to the rear axle, which is split. In other respects, the organs of the voiturette are very similar to those of the carriage, but I am fearful that these voiturettes are now built too light, and it does not take very much pounding to knock them to pieces. It has been my experience to find that when a man buys a carriage to seat two people, he invariably wants at the end of a few months to run four people, and it usually happens that the voiturette will not stand such heavy loads.

I have still to say two words about very heavy carriages and lorries in France. Very few large steam lorries have been built. England, perhaps, has made more advances than any other country in this direction. They are now building trucks there with four and five tons carrying capacity, but I have been told by a very competent English automobile engineer that when these lorries are run by private individuals who have one or two in their service, they are more expensive than horses. When, however, more than five are run, and a proper staff organized to take care of them, they can be run cheaper than horses. In Germany, there is a very large manufacturer who makes a specialty of gasoline-driven lorries, and the recent trials of some of these lorries, at the German, Austrian, and, I believe, Russian army manoeuvres, have given much encouragement, and it is my opinion that this field is a very large one. The arrangement of the various organs of these gasoline-driven lorries is very much the same as the general French type. Of course, they are much heavier and will stand a lot of knocking about.

I know that you will all be glad to learn, those of you who are more moderate in your ideas, that the speed question does not interest people so much now as it did a year or two ago. That carriages should be built with power to carry them up hill at a good rate of speed, and through sand and mud, everyone agrees, but this touring through the country at the rate of sixty or seventy kilometres an hour has done much to stimulate legal action against automobilists. Thirty miles (or 50 kilometres) an hour is a very fair speed, and when one can make an average of twenty-five miles an hour, it would seem to me all that can be desired. In order to make this new means of locomotion popular outside of the more sporty element, one must relieve it of the dangers consequent on excessive speeds. Really, a jaunt through the country at from twenty to twenty-five miles an hour gives one the opportunity of seeing the country and of enjoying the society of one's traveling companions. Perhaps some of you gentlemen present, who enjoy the fascination of rushing through space at 40 or 50 miles an hour, do not agree with me here, but I am quite sure that when the effect of this exhilaration wears off, you will join us, the more rational and slower going "chauffeurs." The day of the leather jacket, black trousers, and cap has passed in France; people get into their automobiles as they would into their carriages, and with just as much certainty of getting to their destination in the time calculated, as they would by taking a train.

The Automobile Club of America, of which I have the honor to be a member, by its enterprise and devotion is emulating its friends of the Automobile Club of France, to whom I must say is due the credit of putting automobiling to-day in the popular place it holds with everyone. The great popularity of the automobile in France to-day is not altogether due to the perfection of the French machines, for great credit must be given to the officers and members of the French Club. The officers of the club have done an immense amount of work in having passed reasonable laws referring to the running of automobiles; they have stimulated the legislation and necessary appropriation for the maintenance of roads; they have encouraged the establishment of modern conveniences and good food in the hotels along the lines of communication, which long since had fallen into desuetude, consequent on the abandonment of the ancient diligences; they have established intercommunications between countries, and made it possible for the touring automobilist to disregard the national frontier. A man can now go from Paris to St Petersburg, or from Berlin to Madrid, with but few custom house formalities. They have given to the public an idea of what automobiling really is by successfully managing the several automobile shows which they have organized, each one on a grander scale than its predecessor.

My object, gentlemen, in bringing to

your notice the great good to the automobile cause which has been brought about by the Automobile Club of France, is to bring nearer to you facts which some of you, not having had the opportunity of seeing for yourselves how successfully this thing has been managed abroad, may not have fully appreciated. Do you fully realize what this American Club means to the industry here? Why, gentlemen, it is the man who uses the 12, the 16, and the 40 HP. car, who makes the sport popular. Every facility should be given him to get as many of these powerful cars over here as cheaply as possible and as quickly as possible.

We need not be afraid, here in America, of foreign competition. I want to tell you here that our object should be, that our policy is, to take hold of a foreign machine and show the world how it should be built in quantities. The French are inventors; the French are artists; their methods are those employed in the production of small numbers of any one article, no two of which are ever exactly alike. European shop methods do not allow of their undertaking the manufacture of unlimited quantities of any one article on a thorough plan of interchangeability of parts. America and American methods must now take hold in earnest, and I see no reason why we should not become here the world producers of automobiles on a large scale.

Now is the time, gentlemen, to take hold of this business from a true commercial and manufacturing standpoint, to develop methods of producing a well developed automobile, methods that cannot and shall not be obtained by any other countries of the world. We must stop manufacturing horseless carriages, carriages from which the shafts have been removed, for which the horse has not been taken out of his stable, carriages in which we have tried to hide away connecting rods, pistons, pumps and carbureters—carriages in which the whip socket has been used to hold an induction coil. We must start in manufacturing automobiles, and I feel sure that every effort should be made to induce the bringing into this country, at the smallest possible duty, carriages which will show the masses what automobiles are.

Do not think me non-American. I am simply looking one step ahead of where the usual manufacturer looks. And let me tell you that one thousand carriages have never been produced in any one shop in Europe during any one year. Let us get all of the French carriages we can in this country. What can this competition ever amount to for us, when we take into consideration what it teaches us, and when we weigh properly in our minds that ever important factor, that factor which is usually forgotten, when we consider what the factor of time means; in other words, the time that we can save by so doing.

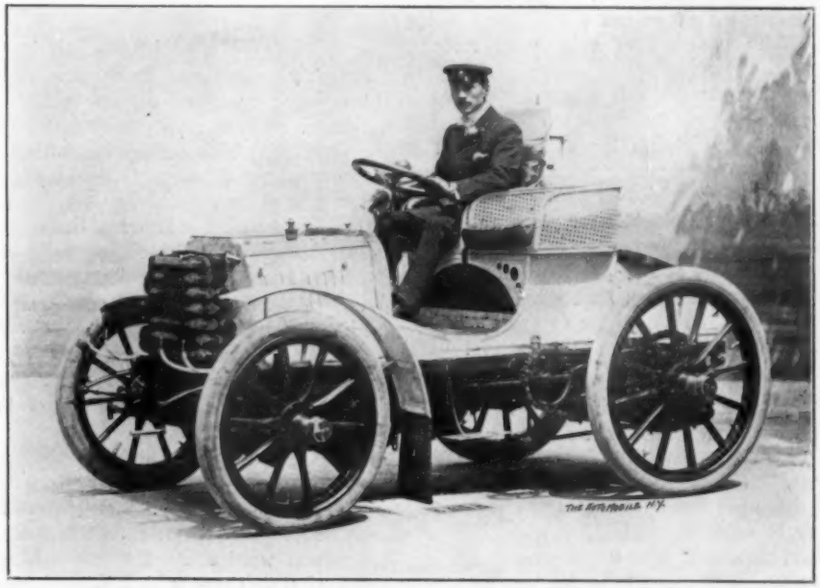
Notes on Electric Ignition

Perhaps the cause of the greater bulk of sparking-plug troubles might be traced to the porcelain insulating stem. The fault chiefly complained about in connection with plugs in which the central wire is cemented in is the breaking away of the cement, so permitting the wire to shift its position and next in frequency comes cracking of the porcelain stem, this latter occurrence being usually attributed to the effects of expansion or to defective material, but although each point named may contribute to breakages, it is more than probable that defective formation of the porcelain stem may have a greater influence. It is, or should be, the common practice to test the finished porcelain plug by heating it to a cherry-red uniformly throughout its length, also applying the more severe test of heating the inner end to redness while maintaining the outer end comparatively cool—just as the conditions would be when at work—and only such stems as will pass through these tests should be employed.

In the majority of plugs on the market the insulating body—the porcelain stem—is supported in position in the outer shell of the plug body by a screwed gland or stuffing box packed with asbestos cord or washers, and in order to prevent movement of the sparking points, and also back-firing or leakage of the spark, it is necessary that this stuffing-box nut should be screwed up with considerable force.

Now, assuming the porcelain stem to be perfectly straight and the asbestos packing equally distributed, then the pressure will be equal, and there will be no tendency to distortion, but if the stem be somewhat warped and the asbestos packing also carelessly applied, then the effect of screwing up the stuffing-box nut—which is presumably true and in line with the plug body—will be to subject the porcelain to unequal stresses at different points in its length, the result being that as soon as the stem is sufficiently heated to set up the slightest degree of expansion it will in all probability crack, and so cause a short circuit. This theory was recently practically demonstrated in my own experience; in a purchase of a dozen porcelain stems one stem after another fractured, and a close study and examination led to the above conclusions, which were justified in great measure by taking the remaining porcelain stems and accurately chucking them into the lathe, discarding altogether those which proved much out of truth, and grinding off the inequalities of the others until they presented a true surface. Result: not one of the latter group cracked under prolonged tests.

The moral of this is that it is not sufficient to merely renew the defective stem, but to see that the renewal is capable of surviving the tests named, the whole argument being conclusive proof that cheap sparking plugs or their component parts are dear at any price.—T. H. Hawley in Motor Car World.



CHARRON IN HIS 20-HP. PANHARD.

A local show of automobiles and bicycles is to be held in Indianapolis, Ind., in February next. The show will be held at the Cyclorama Building, the available space being 15,000 feet.

The Pacific Coast Automobile Co., Bakersfield, Cal., has placed an order for twelve vehicles to run between McKittrick and Coalinga. Another line is also contemplated by the company between Famosa and Paso Robles.

Correspondence.

Space will be given on this page to letters concerning the Automobile, its operation or construction, to accounts of tours or runs, routes of travel, good roads, etc. When requested by correspondents their names will not be published, but must always be given in the communication to the Editor.

Tendencies in Gasoline Vehicle Design.

Editor THE AUTOMOBILE:

I am at present a subscriber and hope to be next year again, and I, therefore, take the liberty to ask you a few questions, as I want to build myself an "auto" on most modern ideas.

1. Why is wheel steering better than lever? Do you advise it on a 1,200-lb. auto?

2. What are the advantages in placing the motor in front, over or at the front axle, instead of in rear?

3. Who makes best auto. with motor forward?

4. What pattern hub is best for a 1,200-lb. auto?

5. Is forced circulation an advantage?

6. What horse power motor would you advise? What type?

I want an automobile for pleasure, easy to get it in and out, easy to handle, not for racing, but it must go if needed at 25 to 30 miles, at times, an hour.

7. Would you advise me to get a three-wheel automobile? If not, why not?

H. W. H.

Chicago, Dec. 9, 1901.

[1. See correspondence and editorial columns in THE AUTOMOBILE, issues of June, July, August and September last. On gasoline vehicles the wheel steering gear is rapidly supplanting the lever or tiller, because it does not require constant muscular effort and attention on the part of the operator.

2. The advantages of placing the motor in front are its greater accessibility and the fact that it can be placed vertically instead of horizontally, the former position being less liable to cause an excess of oil to work up around the pistons and interfere with the ignition. Usually, also, the weight is better distributed with the motor in front.

3. Among foreign machines with the motor in front, the Panhard, Mors, Daimler, and Napier are considered to stand at the head. This arrangement is comparatively a new thing on this side, and it would scarcely be fair to make comparisons among American vehicles.

4. For wood wheels, the artillery and Sarven designs are most popular.

5. Forced circulation gives more rapid and certain cooling, and enables rediators or cooling coils to be used to prevent the water from boiling. A reliable pump is very essential with this system.

6. For a 1,200-pound runabout, 6 HP. if with a 3-speed transmission, or 8 HP. with a 2-speed transmission, should be ample.

If three wheels are employed, the usual arrangement is to have two rear driving wheels and a single front steering wheel; and this must be pronounced the most feasible arrangement. The difficulty with it is that it is necessary, in order to insure stability and avoid danger of upsets, to put by far the larger part of the weight on the rear wheels; and this arrangement, while it has some advocates, frequently leaves the front wheel with insufficient weight on it for reliable steering. The impossibility of combining proper stability with proper weight distribution is the principal objection to this system, but the other features which it involves are frequently criticised by the opponents of this system, and, we must add, as stoutly defended by its advocates.—Ed.]

The Light Car.

Roughly speaking, there are three things the public desire—reliability, quietness, power. Now there is no reason at all why a motor-car should not be constructed so as to be reliable at all times, and if manufacturers were to pay attention to small matters a little more than they are accustomed to, we should not have so much to complain of.

The present year has taught us many things about the light car, the chief defects being noisiness, inaccessibility of vital parts, faulty brake power, uncomfortable seating, and perhaps one or two other things.

Reliability may be said to depend upon the engine and gear and their constituent parts, and the tires. The writer will treat of the former later in this article, but now a word about the tires. If one has solid tires there is that happy feeling that one is not forever confronted with the possibility of a puncture or a burst, which usually means a delay of an hour or so. But is the light car suited for solids? In the writer's opinion it certainly is not. There is great loss of comfort in the first place, and in the second place solids are not suitable for speeds over about sixteen miles per hour. We naturally turn to the compound tire and similar articles, such as the New York tire. There certainly seems a large future for the last named, as from all accounts it appears to possess the comfort of the pneumatic and also the practical immunity from either puncturing or bursting, and if such a thing as a puncture does occur, no great harm is done in driving the car with the tire deflated. The Collier twin tire seems to possess many advantages, and is certainly worth a good trial. If eventually pneumatics are decided on, it is advisable to carry a spare outer cover and tube, or, better still, two tubes, so that in the event of mishaps there may be as little delay as possible.

If we are going to have a really nice-looking light car next year, there must be some provision for the carrying of spare tires. Tires strapped on the outside of a car in any convenient place look very bad, and there is absolutely no reason why they should not be carried inside if proper arrangements are made. This fact brings to light another defect in the present light cars. There is hardly any room for luggage, etc. All tools and spare parts must be to hand without requesting passengers to dismount while the seats are removed.

We now come to the question of power. The car is to seat four and travel at a fair speed, and be capable of mounting any main road hill in Britain with its load. Therefore, for the power to be ample and above the adverse influences of bad roads and bad weather, the engine should not be far from, say 10 HP. With 10 HP. behind it there is not much a light car will not do.

In a large number of the light cars of this year we find a single-cylinder engine of anything from 4 to 6 HP. running at speeds from 1,000 to 2,000 revolutions per minute. The noise of these little cars is terrific, and they give a very bad impression to the public. Of course it is obvious that a little motor of, say, four-inch bore by four and a half stroke can only give its power by running at a high speed, and the only remedy is to have an engine with two or more cylinders running at a slow speed and regulated by a governor. The ideal oil engine would be a rotary one, but this happy ideal is at present unattainable. However, we approach the advantages of the rotary engine by having more cylinders. If one can imagine an ordinary reciprocating engine with an infinite number of cylinders, the reciprocating action is almost lost, seeing that no two explosions occur at exactly the same moment. But in dealing with the light car we must keep within our limits. If the writer is anything of a true prophet, the light car next year will have four cylinders for its 10 HP., thus ensuring the maximum of comfort and silence. There are some who object to a number of cylinders on the ground that there is too much to look after, but this is not the case if the engine is properly designed, ensuring no difficulties about lubrication, ignition valves, and the like. Now there are several important details about the engine. It should have a forced system of lubrication to all cylinders in addition to the ordinary splash system. There must be tube and electric ignition. Everyone is well aware of the danger of tube ignition, but we must remember that cars are not built to be capsized, and also that the tube is only a reserve. And a very useful reserve it proves; for in the best systems of electric ignition derangements are liable to occur, and should these derangements occur in pouring rain, the unpleasant job of tracing "shorts," etc., is entirely obviated by lighting up the

tubes. A four cylindered engine will nearly always start from the seat if it has been stopped "on the spark," so a special contrivance to effect this is perhaps unnecessary. All valves must be readily get-at-able, and the bonnet should be arranged to hinge over without undoing numerous butterfly nuts. The position of the engine has not yet been mentioned, but readers of this article have no doubt observed that the writer fancies the front, à la Panhard. The front is undoubtedly the best, as the engine is so readily accessible, in addition to a few other advantages which hardly come under the scope of this article.

The writer has quite satisfied himself that at present the Panhard gear and system of driving has not been surpassed, and also that in careful hands it gives no trouble. We may naturally look for four speeds forward and one reverse, thus dispensing with the backward driving bevel of the older type of Daimler and Panhard. A backward speed of about eight miles an hour is all that is ever needed. Now, are we going to have chains? Undoubtedly yes. The Renault method of driving may be very nice for very light cars, but the live axle is decidedly open to question on cars of over 10 cwt. On any car the shock of starting is great, and if the clutch does happen to be at all fiery and is injudiciously engaged, there is a very good chance of something "going" sooner or later. With the usual system of chain-driving a chain may break or a radius rod may bend. But what about the live axle and jointed shaft? Breakages far graver than chains and radius rods may occur, and therefore the writer recommends chain-driving. Another point in favor of the chain-driving is the fact that it is far quieter. Proper chainguards should be fitted; also an automatic system of chain lubrication.

The countershaft brake should not be less than two inches broad, and it should be double-acting and water-cooled. Neither should the sprocket brakes be neglected, for the countershaft brake is useless in the event of a chain breaking. Under the heading of brakes a few words about sprags may be mentioned. The sprag at its best is a doubtful quantity, and on a very steep grade it is liable to "skip." A far better arrangement would be to have a ratchet contrivance on the back wheels, as some cars have, thus avoiding all possibility of running back.

To conclude, there are several minor points, which the next year's car may improve upon the present one—(1) Large mudguards; narrow mudguards are perfectly useless. (2) Equal wheels, rendering interchangeability of tires possible. (3) A little glass trap on the footboard to enable the driver to see the clutch and the circulating pump. (4) Drain-off cocks for both the petrol and water tanks, and also a tap for the radiators. (5) Electric lamp for watching the sights of the lubricators at night. (6) An electric interrupter on the steering wheel. (7) Lubrication to main bearings from the dashboard. (8) The plate on the gear-box should be affixed thereto by small butterfly nuts, and not by a hundred and one little screws. (9) Good high-tension wire.—R. A. C. in the Motor Car World.

The "Abeille" Motor.

This motor, which is an excellent example of modern French design, is described by Léon Overnoy in "La Locomotion." It is built in two-cylinder and four-cylinder styles, rated at 8 and 16 HP., respectively, and is of 92 millimetres bore by 132 millimetres stroke, or nearly 3⅝ by 5 3-16 inches, and runs normally at 900 R. P. M. The crank case, which in most motors is divided into top and bottom halves at the horizontal plane of the shaft, is here in one piece, with removable ends or heads, and with the cover over the cam shaft also removable. This makes the crank pin brasses somewhat less accesible, but it is claimed on the other hand that by reason of its greater rigidity the crank case may be made to serve as a transverse stiffener between the longitudinal members of the "false frame" supporting it.

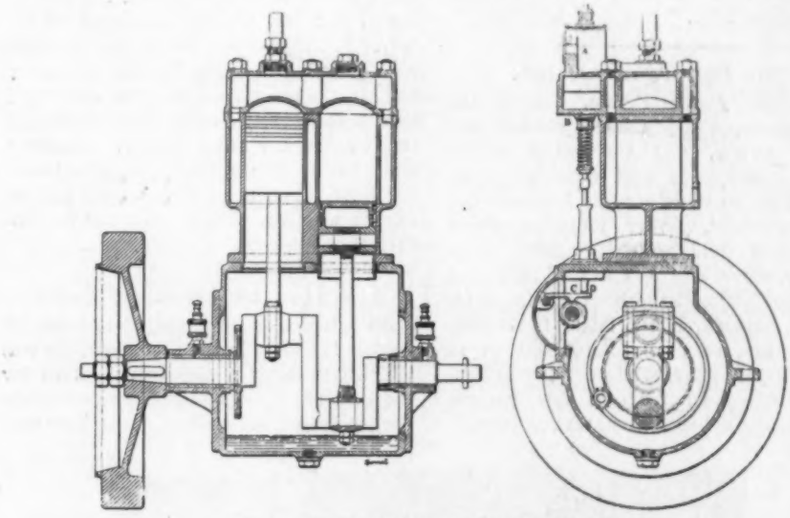


FIG. 1. VERTICAL SECTIONS OF MOTOR.

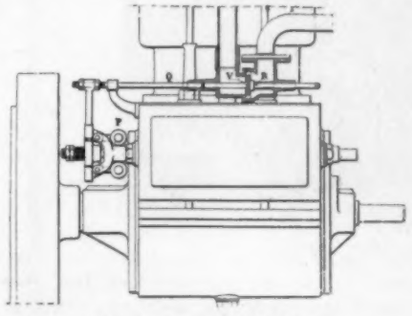


FIG. 2. THE GOVERNOR.

The cylinders are cast in pairs with ample water spaces surrounding every part. The inlet valves seat in cages which may be screwed into place without touching any of the piping, and their removal exposes the exhaust valves directly under them. The spark plugs are placed vertically in the middle of the compression chamber. The bearing surfaces are liberally calculated throughout, and careful provision is made for lubrication. The igniting apparatus comprises magnetic vibrators on the spark coils, and a cam at the front end of the cam shaft, acting on contact springs.

The governor is shown in Fig. 2. It is of the usual centrifugal form, and acts through the stem Q on the valve V and its stem R. The spring (not shown) on the governor balls P themselves, when the engine is at rest, forces valve V open against the pressure of the spring surrounding R, which tends to close the valve against the suction of the pistons. As the engine's speed increases, the centrifugal force of the balls overcomes the tension of their spring and stem Q retreats slightly to the left, allowing the spring on valve V to partly close the latter. The same result will take place in case the spring on the governor balls should break.

The New "Mercedes."

The "Mercedes" Daimlers for 1902, brief descriptions of which have appeared in the French and German automobile press, will contain some striking improvements over last year's styles. The motor is of four cylinders as usual, but the mechanism is wholly encased, nothing, with the exception of the valve stems, being externally visible. Splash lubrication oils all parts. The former heavy regulator is eliminated, all the functions of control being exercised by a simple valve, which

—a new departure for Continental builders—throttles the mixture supply.

Connected with the gear-shifting lever is an attachment which automatically slows down the motor while the lever is in the neutral position when shifting gears; and it is claimed that this renders it unnecessary to disconnect the clutch at such times. This arrangement has the further convenience of silencing the motor during a momentary stop for a restive horse. The motor speed can be regulated between 250 and 1,200 turns.

Ignition is effected on a new system by alternating current and jump spark, instead of by the contact spark in use this year. Two-point ball bearings are used throughout on transmission shafts and axles.

The "Mercedes" will be built in three sizes for touring and racing, of 40, 28 and 20 H.P., weighing respectively 900, 825 and 700 kilos., or 1,980, 1,815 and 1,540 pounds. It is said that machines of lower power will also be built.

The Failure of Alcohol.

It is truly remarkable, despite the many attempts to popularize alcohol as a motive power, and the many strong points which have been recorded in its favor, that so little success has attended the movement. Every motorist would welcome a fluid which promised to be cheaper, safer, and as effective as petrol, and these claims have been advanced for alcohol. Moreover, the latter is an artificial substance easily manufactured in almost every clime, while our petrol supplies are drawn from a few natural sources, and are so limited that a "corner" could be worked in it without much difficulty.

The complete applicability of alcohol to motoring may be chimerical, and consequently all our fond dreams of new home industries created by motoring may have to be abandoned. But, failing alcohol, perhaps some clever chemist may devise some other hydro-carbon which will be cheap, easy to produce, and powerful in use. Should such not be forthcoming immediately, we may hope at least for more attention being given to the heavy oils. A few firms have enterprisingly studied the matter, and with no incosiderable success. We trust that progress in this direction will go much further. The ideal has not yet been reached. When the motorist can command a cheap, universally distributed, compact, and safe fuel, many of the woes which befall us at present will have disappeared.—The Motor Car World.

Stopped the Fire Chief.

A rather amusing, but unpleasant incident occurred last month, when Mr. John Linner, president of the town council of Carlisle, Pa., caused the stopping of Fire Chief Croker, of New York, while on his way, in his Locomobile, to a fire. A man got in the way of the machine and was brushed down, but not injured, and Mr. Croker proceeded on his way. Mr. Linner saw the act and thought he was doing his duty to stop the chief, but Mr. Croker did not see it in that light, and in consequence caused his arrest and imprisonment. Mr. Linner, however, made his apologies, stating that he would not have taken the action he did had he known who Mr. Croker was, and he was therefore released.

A Wagon for Handling Safes.

An interesting new type of commercial vehicle is shown in the accompanying cut, which represents a wagon lately built for the Hall's Safe Co. by the Electric Vehicle Equipment Co., of Brooklyn. It has three motors, two of which drive the rear wheels independently, while the third, of 6 HP., is used for hoisting the safes. The company estimates that a 4-ton safe can be hoisted seven stories in 6½ minutes, as against 2½ hours for the same job when six men furnish the power. Three men only are needed to work the electric truck, which is a saving of five over the eight men, six for hoisting and two for incidental assistance, required by the old plan. The vehicle has the Gibbs system of running gear, with spring pedestals instead of reaches, and the wheels are shod with S evens' indurated fabric tires 6 inches wide, made by the Auto Dynamic Co., 1.0 W. 39th St., New York.

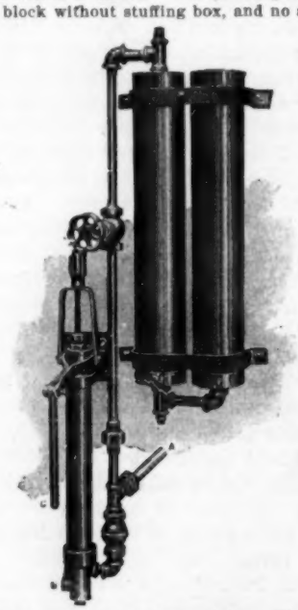
A WAGON FOR HANDLING SAFES.

A New Book.

"Bubble Jingles" is the principal title of a volume of verse concerning what its author, Stuart Travis, alleges to be "the jolly side of the automobile," but which would, we fear, appear in quite another light to the chauffeurs who happened to be victims of such antics of the "bubble" as the author celebrates. The book is printed on rough deckel-edge paper, and the artist-author luminously illustrates his fancies by colored sketches, some of them very droll. Altogether, Mr. Travis is not unsuccessful in his effort to make the chauffeur enjoy, for once in a way, his own tribulations. The volume is published by Rohde & Haskins, New York, and sold for $1.25.

The Phelps Gasoline Pump.

The accompanying cut shows a new gasoline pump for automobiles. The pump proper is encased within a barrel. The piston pump is a simple block without stuffing box, and no attempt



is made to make it perfectly tight. The barrel enclosing the pump is placed alongside the gasoline tank and is connected therewith by an unobstructed passage so that the gasoline stands, it is claimed, in the barrel at the same level as in the tank itself. Any leak by the piston is retained within the barrel and used over again without waste. A peculiarity of the pump is that the engine simply raises the piston and a spring depresses it. When, therefore, the pressure in the receiver balances the pressure of the spring on the piston no more gasoline will be pumped until a portion of it has been used and the pressure in the receiver reduced. As the pump piston is large enough to pump several times the quantity required by the burner the pump is out of action most of the time, the piston remaining in an elevated position. Prices and further information may be had on application to the manufacturer, the Boston Automobile Exchange, 124 Massachusetts Ave., Boston.

Business News.

The Veeder Mfg. Co., Hartford, Conn., announces that it will soon place a speedometer on the market.

The Jewett Motor Carriage Co., Jewett, O., was recently incorporated at Columbus, the capital stock being $25,000.

Schaeffer & Budenberg, Brooklyn, is soon to bring out a catalogue of its water, air, and steam gages, safety valves, etc., for steam automobiles.

The Locomobile Company of America, New York, reports that its export business for the first ten months of the year 1901, amounted to over $100,000.

Frank A. Crowe has established an automobile headquarters at 811 Union St., Brooklyn, N. Y., the location formerly occupied by the Union Automobile Co.

The Adams-McMurtry Co., representative of the eastern department of the Packard automobile, has removed from 114 Fifth Ave. to 317 and 319 W. 59th St., New York.

The Clark Tire Co., Chicago, which has been experimenting for some time, is now placing on the market a mechanically fastened detachable double tube tire.

The Fisher Automobile Co., Indianapolis, Ind., has been incorporated. The capital is $10,000, and the company proposes to conduct a wholesale and retail business.

The Locomobile Company of America is making additions to its London quarters, 52 Sussex Place. The sales for the past nine months in its London territory amounted to 435 machines.

The Olds Motor Works, Detroit, announces an increase in the price of Oldsmobiles to $700, beginning Jan. 1st. The price was increased from $600 to $650 about six months ago.

The Harlem Automobile Co., 159-163 W. 127th St., New York, has opened a storage and repair station. B. C. Barry, F. C. Schussler, Wm. T. Eames and Geo. E. Latham, are the owners.

Chas. J. Moore, Westfield, Mass., is manufacturing automobiles in that city. At present Mr. Moore employs between fifteen and twenty men, and has a number of automobiles and parts under way.

It is reported that Mr. G. J. Loomis, of the Loomis Automobile Co., Westfield, Mass., is endeavoring to interest business men of Springfield, Mass., in the formation of a company in that city.

The Ajax Motor Vehicle Co., 220 W. 36th St., New York City, has brought out an electric runabout, weighing 1,000 pounds. It is claimed that it can be run sixty miles on one charge of battery.

The Heal pump, formerly manufactured by the Detroit Brass & Novelty Co., Detroit, Mich., is now manufactured by the Mobile Company of America, Kingsland Point, N. Y., which has secured the exclusive rights.

The Upton Machine Co., Beverly, Mass., has received an export order for fifty of its 20-HP. transmission gears. The company is now building quite a number of 20-HP. 2-cylinder gasoline motors for touring vehicles.

The Baker Motor Vehicle Co., Cleveland, O., is manufacturing a charging set which comprises a 3-phase motor and a continuous current generator of 20 volts for charging automobile batteries from alternating current mains.

The Stein Double Cushion Tire Co., Akron, O., is to build a new factory. The company will manufacture a newly invented cushion tire for automobiles. It is expected to have the building ready for occupancy by March 1st.

The H. H. Franklin Mfg. Co., Syracuse, N. Y., had a disastrous fire last month just as it was ready to begin the manufacture of automobiles and specialties. The building will be rebuilt and the business of the company resumed.

The Century Motor Vehicle Co., Syracuse, N.Y., has purchased the building in which it has been doing business and has heretofore rented. This will give ample factory facilities, with an opportunity for enlargement in the future.

The Western Automobile Co. is the name of the successor to the Cleveland Automobile Storage & Repair Co., Cleveland, O. The company will conduct the western branch of the Oldsmobile Co., with Mr. R. R. Owen as manager.

The Geneva Automobile & Mfg. Co., Geneva, O., has secured the services of W. C. Bucknam as superintendent of its factory, a position recently made vacant by the resignation of A. Thompson. Mr. Bucknam formerly had a factory at Portland, Me.

The Motor Truck & Vehicle Co., Columbus, O., has been organized with John M. Clark, president; M. S. Hopkins, vice-president; Theo. Liresay, secretary; F. R. Huntington, treasurer. The company proposes to manufacture gasoline motor wagons and trucks.

The Niagara Motor Vehicle Co., Buffalo, N.Y., has been organized with a capital of $25,000, to manufacture electric, steam, and gasoline vehicles, motors, etc. Chas. F. Stone, Wm. A. Weed, R. S. Weed, Helen I. Slater, and Chas. A. Lindstrom are the incorporators.

The commission of awards of the Pan-American Exposition has reconsidered its action in awarding a silver medal to the Haynes-Apperson Co., and instead has awarded it a gold medal. The reconsideration is due to the record made by the Haynes-Apperson machines in the late endurance run.

The Henry Ford Co., Detroit, Mich., was recently organized in that city, with a capital stock of $60,000. Clarence A. Black is president; Albert E. F. White, vice-president; Wm. H. Murphy, treasurer; L. W. Bowem, secretary; Henry Ford, mechanical engineer. The company will manufacture an automobile after designs of Mr. Ford.

The National Sewing Machine Co., Belvidere, Ill., is reported to be about to engage in the manufacture of gasoline vehicles under French patterns, and using a four-cylinder motor. The company has already a contract for making a number of vehicles for the Friedman Automobile Co., of Chicago, but its own vehicles will not be ready for the market for several months.

The Equipment Motor Co. was organized last month in New Jersey with a capital stock of $6,500,000. The company will manufacture motors for automobiles and stationary power purposes. Mr. J. H. Hoadley, president of the International Power Co., is interested in the new company.

The American Cycle Mfg. Co., with a capital of $8,000,000, and the International Motor Car Co., having a capital of $2,000,000, were organized last month in New Jersey. The board of directors of both companies is as follows: Jos. E. Bromley, R. L. Coleman, George Pope, Theo. E. Merseles, and Paul Walton. All are directors of the American Bicycle Co. except Mr. Walton.

The Prescott Automobile Co., whose factory is located at Passaic, N.J., has just made a shipment to London of Prescott touring cars which is to be followed by weekly shipments to complete a large order the company now has in hand for that market. The company is a comparatively new concern in the automobile field, and these shipments are highly complimentary to its product.

The Brown-Lipe Gear Co., Syracuse, N. Y., announces that it has just arranged with J. Franklin Peterson to act as its sales agent in Ohio, Iowa, Indiana, Illinois, Michigan, Wisconsin, Minnesota and Missouri. Mr. Peterson's headquarters are at 165 Lake St., Chicago. He also represents in the same capacity the Baldwin Chain Co., American Roller-Bearing Co., and the Midgley Mfg. Co.

The Fournier-Searchmont Automobile Co. was incorporated last month at Albany with a capital of $2,000,000. Spencer Trask, John I. Ellicott, Acosta Nichols, E. N. Porter, Cecil Barret, Benjamin Prince, Chas. J. Peabody and Carl G. Smedburg are named as directors. The principal owners of the new company are understood to be residents of Philadelphia, where the factory will be located. The plans of the company have not yet been definitely announced.

Mr. Chas. H. Tucker, manager of the Chicago branch of the Winton company, has secured quarters in a practically new store building on the southwest corner of Michigan Ave. and Fourteenth St., and has also interested a number of other automobile sales agents to locate in the same building. The building has four large storerooms, and owing to its favorable location, it is expected that it, in the future, will become the center of the automobile selling district.

The Standard Mfg. Co., was recently organized at Kokomo, Ind., with a capital of $50,000, for the purpose of manufacturing and marketing a new gasoline vehicle at a low price. The officers are as follows: E. G. Shortridge, president; S. J. Myers, vice-president; W. P. Sellers, secretary; W. D. Irwin, treasurer. About twenty-five men will be employed at the start. The new company will take over the business of a former company which did an extensive business in the sale of gas and gasoline engines, the sale of which will be increased.

The Diamond Rubber Co., Akron, O., had a somewhat disastrous fire at its New York branch store on Dec. 18th. The stock carried at that point was completely destroyed, but as its surplus stock was at 15 Warren St., the company was enabled to fill orders promptly. The fire, however, has caused an interruption in its repair work, but in the meantime this is being taken care of at its branch offices in Boston, Philadelphia, and Buffalo. It is expected to be able to resume the repair work in New York in the early part of January.

The Union Automobile Co., Union City, Ind., is putting up a building for the purpose of manufacturing automobiles. The factory is to be completed early in January, and the active work of manufacturing commenced about the middle of January. The capital stock is $50,000. Two styles of gasoline vehicles will be made, one being a single-seated machine, weighing 1,400 pounds, equipped with a 4-HP. motor, and a larger machine, weighing 1,800 pounds, equipped with a 7-HP. motor. The motors will be made by the Buckeye Mfg. Co., Anderson, Ind., after designs of John W. Lambert.

The Auto-Bi Co., Buffalo, N. Y., which recently succeeded to the motor bicycle business of the E. R. Thomas Motor Co., has added two lines of automobiles and in future will be known as the Buffalo Mobile and Auto-Bi Co. The company purposes marketing its product through agencies. The 1902 model will include a motor bicycle equipped with a 1½-HP. motor, and one equipped with a 2-HP. motor. New and original features are promised for these machines. The two new lines of automobiles will be sold at $600 and $750, respectively. One will weigh about 400 pounds, and will be equipped with a 3½-HP. motor and will be known as Buffalo Model 6. The other will be equipped with a 6-HP. water-cooled medium speed motor, and will weigh about 600 pounds. The latter will be known as Buffalo Model No. 7. The company announces that it will be able to make shipments in January.

Patents.

List of Automobile Patents granted during month of December.

686,786, 687,172—Variable speed gearing. Issued to C. Upton.

687,173—Variable gearing. Issued to C. Upton.

687,054—Motor vehicle steering gear. Issued to J. F. McNutt.

687,067—Automobile running gear. Issued to E. F. Steele.

687,588—Automobile steering mechanism. Issued to E. Thomson.

687,599—Apparatus for control of automobiles. Issued to E. Brillie.

687,566—Speed changing device. Issued to C. O. Johnson.

687,498—Motor vehicle. Issued to W.A. Crowdus.

687,672—Ball-bearing vehicle wheel. Issued to W. J. Bray.

688,025—Electric automobile controller. Issued to F. F. Loomis.

688,024.—Automobile steering gear and brake. Issued to F. F. Loomis.

687,756—Carbureter. Issued to C. M. Kemp.

688,040—Explosive engine starting device. Issued to W. E. Twichell.

688,245—Explosive engine. Issued to A. Hayes.

687,876—Cushion tire. Issued to J. E. Furlong.

688,108—Motor vehicle brake. Issued to W. A. Maybach.

688,266—Self-propelled vehicle driving mechanism. Issued to A. W. Sandell.

688,101—Motor vehicle. Issued to H. J. Lawson.

687,744—Motor vehicle running gear. Issued to C. R. Greuter.

688,257—Motor vehicle running gear. Issued to R. L. Morgan.

688,408—Carbureter. Issued to M. Gohler.

688,776—Carbureter. Issued to C. V. Greenamyer.

688,474—Motor vehicle driving gear. Issued to H. W. Lupton.

688,405—Motor vehicle. Issued to Garrels & Kimball.

688,591—Motor vehicle. Issued to G. W. Cary.

688 814—Carbureter. Issued to O. Andreson.

688,931—Carbureter. Issued to Carter & Zierlein.

689,004—Carbureter. Issued to C. M. Kemp.

688,838—Motor vehicle. Issued to F. F. Dorsey.

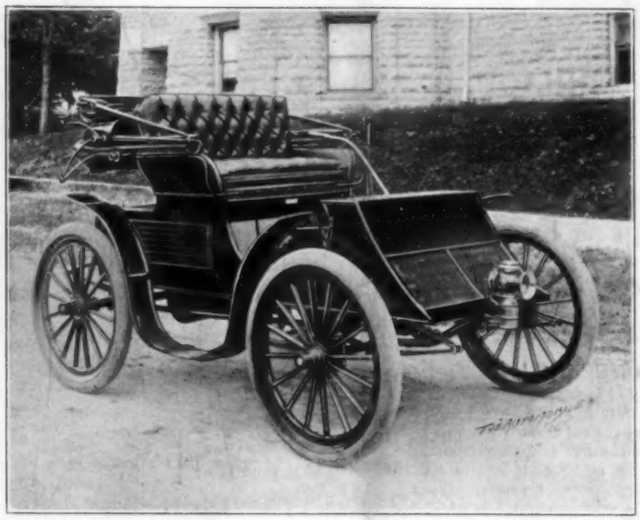
689,001, 689,002—Motor vehicle. Issued to J. T. Hill.

689,332—Steam propelled vehicle. Issued to S. Straker.

689,099—Feeder for motor vehicles. Issued to W. J. & G. Lane.

Our 1902 Model Wins Everything in Which It Has Been Entered

Highest Award and Fastest Average time of any American Machines in the New York-Buffalo Endurance Contest.



Blue Ribbon and Highest Honors in the Long Island 100-mile Endurance Run without a stop.

It won the Silver Cup in the 5-mile Handicap at Fort Erie track, Buffalo, N. Y., September 27, 1901. Also the "Detroit Free Press" Silver Cup at Point Grosse track, Detroit, Mich., October 10, 1901, in the 10-mile open, for vehicles weighing 2000 lbs. and under.

Time for the 5-mile Race, 9:29 **Time for the 10-mile Race, 17:45**

YOU can get this same Machine by ordering our Standard Two-passenger Phaeton of our 1902 Model. Write for full particulars. No Agents.

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One on superiority of vehicles and another on variety and completeness of exhibit. These were the only gold medal awards for electric automobiles.

Forty Miles on each charge of Exide Batteries . . . .

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